PEST CONTROL

APRIL
1955

In This Issue:

Naval Expert Describes Aerial Mosquito Control Operations ..... Pg. 9

PCO Provides Best Fly Control Ever at Illinois State Fair ..... Pg. 14

More Osmun Pictures of Insect Damage ... Pg. 18

Giant Calif. Experiment Proves Methyl Bromide Nips Khapra Beetle Pg.22

Dipterex and Chlorthion Two New Chemicals For Flies, Mosquitoes Pg. 28

Mosquito Identification Simplified With This CDC Pictorial Key .... Pg. 32

Miller Unveils Biology of Florida Termites Pg. 34

New Sanitation Section Begins ..... Pg. 40

A stream of spray is released by this Navy airplane during mosquito control operations in California. Spray equipment, developed by Navy, can be installed in a few minutes and removed in seconds, eliminating need to restrict aircraft solely for spray projects. Complete story on aerial spraying for mosquitoes begins on page nine.

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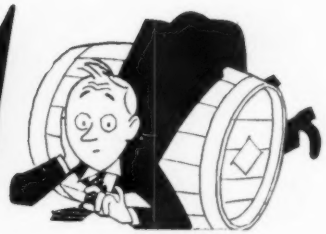

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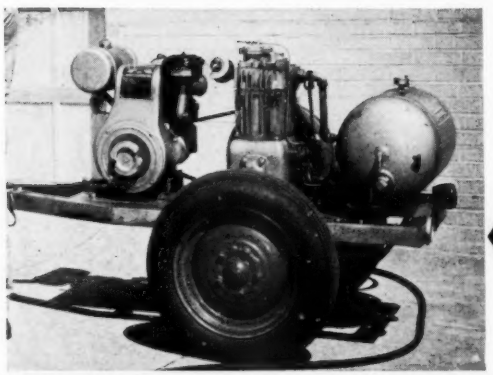

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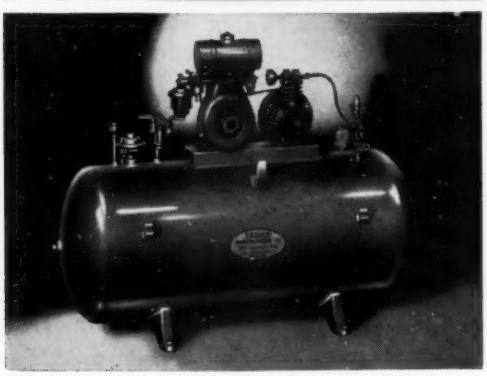

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But You Still Need Chemicals

Sensible as current recommendations are that the best way to control flies (all pests, for that matter) is through sanitation, it's the chemicals PCOs and the public rely on to give relief right now.

Preaching sanitation is a little like the minister's weekly sermon. Little by little his messages save a few souls, but the process is a slow one. So it is with trying to get customers to practice good housekeeping. They won't take the sometimes expensive measures necessary to keep their "house" clean unless John Law orders them to action. And sanitation enforcement legislation with teeth in it just isn't popular.

Why are scientists constantly working to outsmart insects which seem to acclimate themselves to pesticides already developed? Because the public demands it.

We can count our blessings that researchers aren't sitting back waiting for the "Sunday Sanitation Sermon" to solve all community vermin problems. John Q. Public doesn't like to do what's good for him. So — the chemists have to keep ahead of insect resistance roadblocks.

Despite the tolerance flies and mosquitoes show to some pesticides, the PCO can set up a protective curtain for his demanding client. Maybe calls have to be made more often, and maybe aerosols have to be sold for interim treatment, but the chemical tools available to this industry (and in many cases to this industry alone) enable pest control firms to reduce the number of invaders scaring their customer's clients away. Maybe your account is the epitome of cleanliness, but your neighbor, or the owner of that puddle in the next lot isn't as conscientious in eliminating harboring and breeding places. Your chemical barrier around your customer's property has to kill off those invaders that don't know they can't live in his spanking clean establishment before they try to find out for themselves.

Sanitation counseling is becoming a valuable part of over-all pest control service and sooner or later your advice will be heeded. But in the meantime you've got to protect lives and property with effective pest control chemicals. Know what's available and use it wisely.

James A. Nelson

Editor

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H. B. WILSON
Assistant Editor

R. J. HOFFER
Circulation Manager

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FEATURES

Aerial Mosquito Control
By Lieutenant Commander John M. Hirst 9

Fly Control Program on the Illinois State Fairgrounds
By Arthur W. Gibson 14

Recognition of Insect Damage
Section Two: Synthetic Fabrics, Finished Cloth, Glazed Paper, Books and Their Bindings
By Professor John V. Osmun 18

Methyl Bromide Dooms Khapra Beetles 22

Two New Organic Phosphates, Dipterex and Chlorthion
By Dr. Rosmarie von Rumker 28

Pictorial Key to Some Common U. S. Mosquitoes 32

Servicemen's Instructions for Fly Control 33

Biology and Habits of Termite Species Found In Florida, by Dr. E. M. Miller 34

Damp-Wood Termites Hitchhike Ride in Lumber Shipped East from West Coast, by Professor J. J. Davis 38

Sanitation Section 40

Look Alikes: 4, American Cockroach and Australian Cockroach, Pest Control Primer
By Dr. Marion E. Smith and Hsiu-fu Chao 48

Bull Horns in the Junk Shop, Pest Control Notebook
By Joseph R. Gross 50

DEPARTMENTS

Patents 50
Pest Control News 52
Insect Report 58
Organization News 60
Calendar of Meetings 60
Personal Briefs 61
Classified Ads 61
Pestales 62
Advertisers' Index 62

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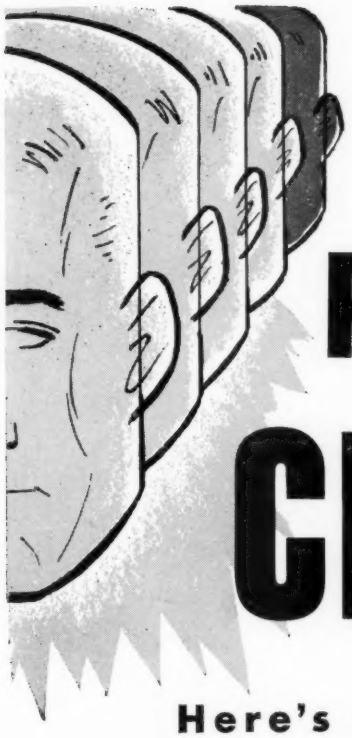

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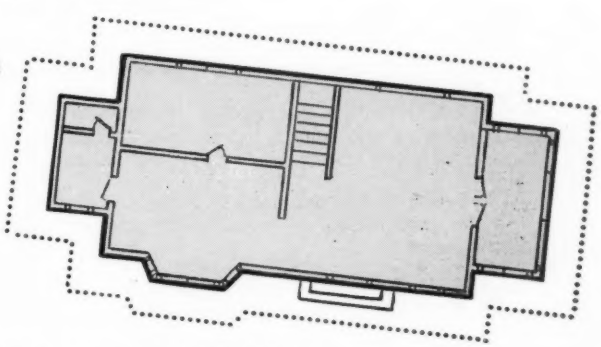

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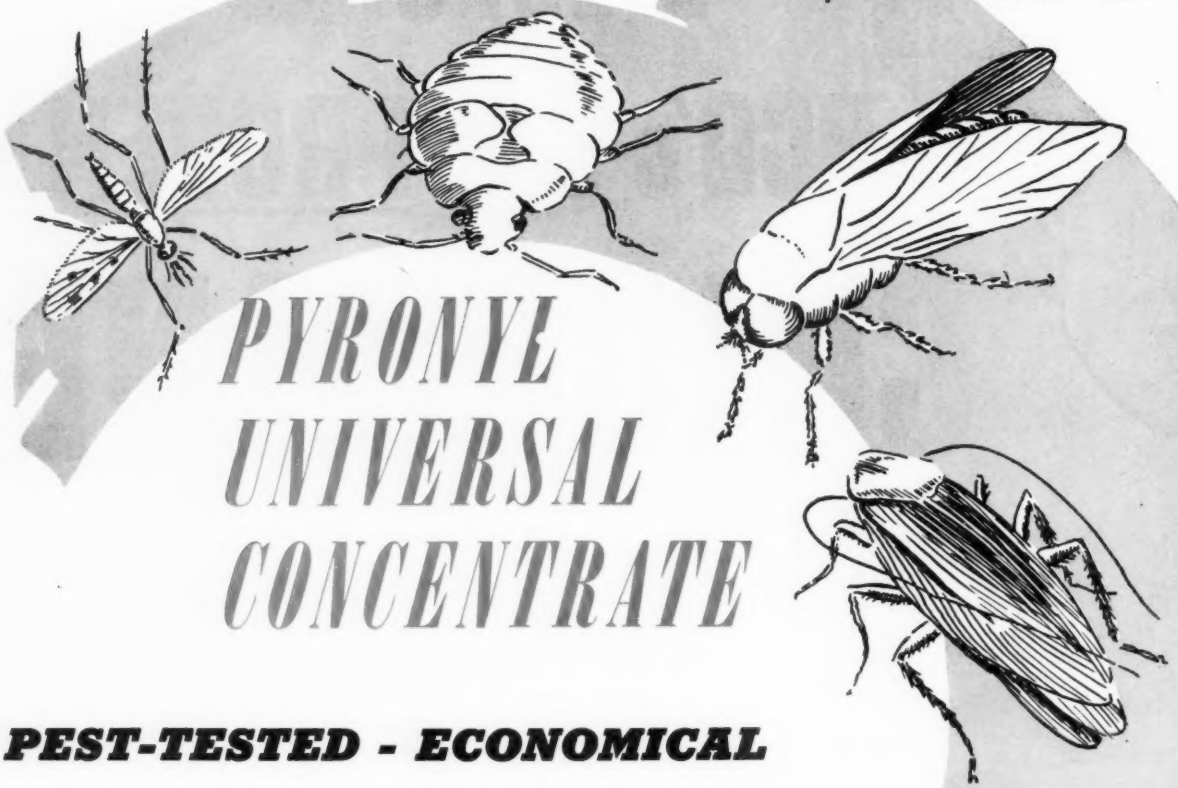

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Large scale mosquito abatement programs can be carried out rapidly and effectively with

Aerial Mosquito Control

by
JOHN M. HIRST

Lieutenant Commander, U. S. Navy
Medical Service Corps
U. S. Naval Air Station, Alameda, Calif.

AFTER more than 30 years of insecticide dispersal by aircraft, it is opportune that we review this technique. A recent report on the use of aircraft for insect control in general states three severe limitations exist: (1) It is exceedingly hazardous to life and property; (2) it is extremely easy to misuse large amounts of funds; and (3) it is evident that wide-spread application of insecticides to larval breeding areas encourages the development of resistant populations. Other recognized limitations include the difficulty of penetrating ground cover, the difficulty of applying uniform coverage, narrow range of favorable meteorological conditions, possible damage to important plants and animals, and the requirement of highly-trained personnel.

It is amazing that the result of these limitations has left any operators who favor the use of airplanes. We read, "the airplane is holding the spotlight in the Department of Agriculture's battle against mites, spiders and insects which take tremendous toll of this country's crops."

In the American Mosquito Control Bulletin No. 1, **The Use of Aircraft in the Control of Mosquitoes,** it says, "Aircraft dispersal of DDT under many circumstances is undoubtedly the most satisfactory method of controlling mosquitoes . . . " And USDA miscellaneous publication No. 606 states, "DDT can be applied effectively from airplanes for the control of both larvae and adult mosquitoes."

In the Handbook of the Hospital Corps, United States Navy, 1953, it says, "Airplane dispersal of DDT solutions is an effective and rapid method of spray killing adult mosquitoes over large areas. The method is particularly useful during the early phases of occupation before organized spray killing of adult mosquitoes or larvicidal operations on the ground can be initiated."

These statements were prepared by experts and refer to mosquito control, not insect control in general. Why then is there hesitation in the use of the airplane as a means of controlling mosquitoes?

During the period following a

Presented before the 41st annual meeting of the New Jersey Mosquito Extermination Association and the 10th annual meeting of the American Mosquito Control Association, Atlantic City, N. J.

The opinions or assertions contained in this article are the private ones of the writer and are not to be construed as official or reflecting the views of the Navy Department or Naval Service at large.

severe flood in this country, the persons responsible for the prevention of disease would not authorize the use of aerial spraying for the control of large areas of flooded land where surveys showed extensive breeding of mosquitoes. This attitude was maintained even though the use of airplanes for distributing insecticides has been shown to have a number of advantages over other methods of applying these chemical materials. Included among these advantages are fewer personnel, rapid area coverage, ease of operations, small amount of equipment, timeliness of application and economical operation.

This situation of question concerning this tool in the control of mosquitoes is the responsibility of many who place too little or too much emphasis on the airplane for the dispersal of insecticides for mosquito control.

• How About Accidents?

In 1951, it was reported 348 accidents occurred during aerial spraying. Fifty-three of these accidents involved fatal injury and 41 produced serious injury. One hundred and fifty-six aircraft were destroyed. These figures do not show damage done to property other than the involved aircraft.

All these data and more can be set forth in opposition to aerial spraying but they cannot be related to mosquito control through aerial dispersal of insecticides. When these data are investigated it is believed that "crop dusting" claims more than 95% of the losses of life and property. When the airplane is properly employed in the control of mosquitoes, it is a different set of rules and a less depressing picture.

Most accidents related to mosquito control spraying are due to: (1) mechanical failure; (2) pilot error or the use of a low level permit as an excuse for illegal "flat-hatting"; (3) improper briefing of personnel; and (4) lack of appreciation of pilot problems in relation to the work to be accomplished. These same reports might be used to explain many of the accidents which occur in just plain flying.

• Three Requirements for Safe, Efficient Operations

What is required if the control of mosquitoes through aerial spraying is to be efficient, economical, safe and practical?

1. There must be a mosquito control program which has a firm foundation. It must have a plan of survey, a system of determining control techniques and a method of evaluating results. Into this program the airplane can be used to augment and supplement controls but seldom will the airplane supplant organized controls.

2. There must be a minimum of qualified personnel who know meteorology for pilots (Civil Aeronautics Bulletin No. 25), local CAA regulations and special legislation concerning the dispersal of insecticides, and American Mosquito Control Association Bulletin No. 1.

3. There must be a mutual briefing period when the pilot is given complete ground observer data and the operator is acquainted with the pilot's needs. It is as valuable for the pilot to accompany the control man on an occasional ground survey as it is for the operator to fly over the area with the pilot on occasion.

From military experiences it has been established that the pilot must be experienced in the type of aircraft and the special spray equipment prior to his initial spray assignment. This problem can be excluded where aerial spraying is done by contractors who are properly certified. It is impractical for districts to own their own aircraft under most conditions. However, even during aerial spraying for mosquito control under contract, the above suggestions are necessary for effective results.

• Developments in Aerial Control

These three developments in the field of mosquito control by the aerial dispersal of insecticides are worth consideration:

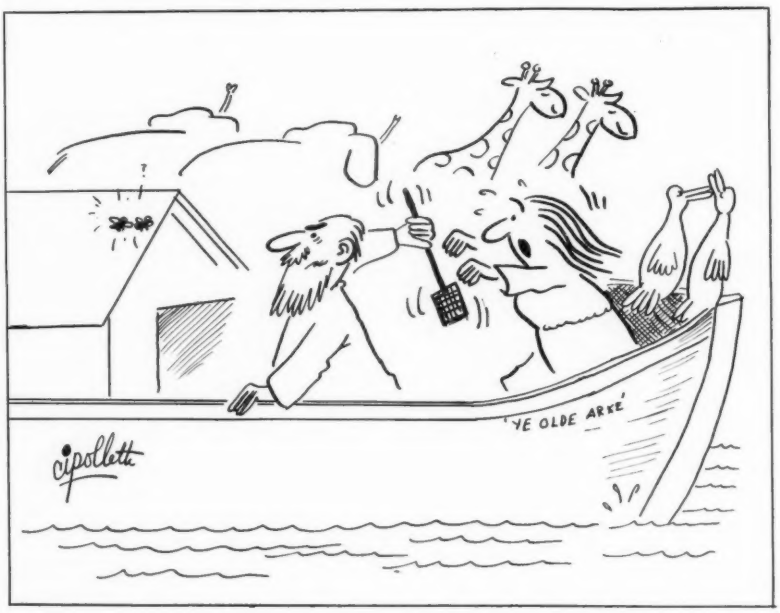
1. New dispersal devices for use with special aircraft permit the pilot to maintain better speeds and altitudes. It is possible to spray "too slow and too low." These modifications have reduced the hazards in mosquito control spraying.

2. Mosquito control, both larviciding and adulticiding, is now planned in aerial spraying. With a mass median of 150 microns, an all purpose spray is being used efficiently.

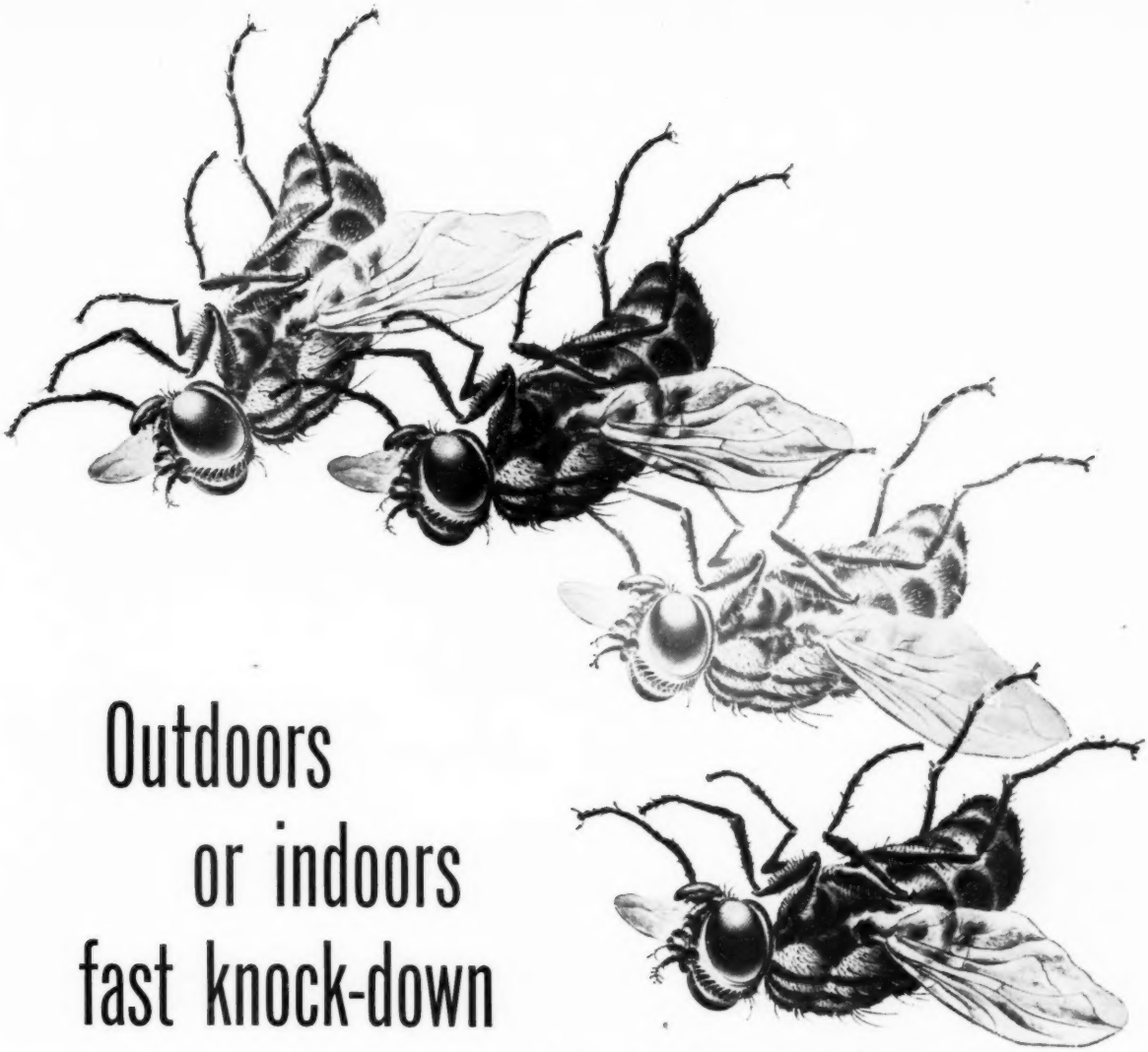
3. Wider swath is the result of better equipment, increased control of drop range, higher and safer altitudes and speeds. In early 1945 the swath covered by many planes was less than 40 feet. In 1953, with the new techniques and equipment, measured effective swaths exceeded five times the wing span. This provides mosquito control at a cost less than any method of ground application.

Probably one of the most influential reports concerning aerial dispersal of insecticides is that which advances the theory that resistance to insecticides is developed rapidly in mosquitoes where aerial spraying is used frequently. It is not denied that resistance to insecticides can develop but the heavy blame placed on aerial spraying is not accepted in many camps.

Most directives for the distribution of insecticides from aircraft present dosage limitations on the toxicant. DDT may not exceed 0.3 pound per acre according to most recognized authorities. Tests prove that 0.1 pound of lindane is also adequate for mosquito con-



"Noah!"



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• Formulations Used

Since early 1950, where extensive areas were treated by insecticides from airplanes, two phases of our experience are established:

1. The amount of the finished insecticide deposited per acre is as important as the amount of the toxicant it contains. When 0.3 pound of DDT is sprayed over 1 acre in ½ gallon of finished insecticide, control is considerably more effective than when the same quantity DDT is dispersed in only one quart of finished spray per acre. One directive states that when a 20% DDT solution is used, one gallon must cover 5.6 acres. Less expensive, more effective controls result from using a 5% DDT solution dispersed at the rate of 1 gallon to 2 acres. It is realized this reduces the "payload" per plane but experience shows this technique also reduces the number of applications required per season.

2. The addition of an "energizer" to the finished spray solution is a valuable amplifier to efficiency. Since certain aliphatic thiocyanates (such as lethane or thanite) are formulated as Standard Navy Insecticides, small amounts of these were added to DDT and BHC sprays which were under test in 1949 and early 1950. It is possible to reduce the amount of DDT as much as 40% if a compatible energizer is added. Two pounds of lethane (regular) or two pounds of lethane (regular) and lethane (special) in equal quantities are added to 100 gallons of 3% DDT or 0.5% BHC (lindane) to formulate our insecticide which proved effective as a larvicide and as an adulticide.

• Summary

In summary, it is apparent that:

1. The airplane is a safe, economical and effective tool for the control of mosquitoes.

2. The airplane has developed beyond the "gimmick" stage for the spraying of insecticides in mosquito control. There is no place for the "plumbers nightmare" on this scientific dispersal device.

3. A better understanding of the requirements is acknowledged by pilots and aircraft engineers. A better understanding by the mosquito control operator will provide greater savings in labor and personnel costs.

4. Improved techniques are established for the use of the airplane in the dispersal of mosquito control insecticides. A minimum of 2 quarts per acre is recommended, the amount of insecticide (toxicant) remains as approved but the addition of an activator will allow savings in the reduced amount of the toxicant required. Prevention of resistant mosquitoes is assured by effective controls.

The airplane as a tool for mosquito control is a highly specialized device in the kit of the scientifically trained operator. Mosquito control operators must be given top flight education if they expect to function in this field today. The equipment and supplies are developed far beyond the standards when laborers were employed as mosquito control men. Operators and supervisors in mosquito control have had to grow with their profession or avoid professional tools and toxic chemicals.

La. Health Board Centennial

Louisiana State Board of Health, oldest state health board in the U. S., will celebrate its 100th anniversary in May. To commemorate the event, the Southern Branch of the American Public Health Assn. and the Louisiana Public Health Assn. will meet in New Orleans' Jung Hotel, May 10-13.

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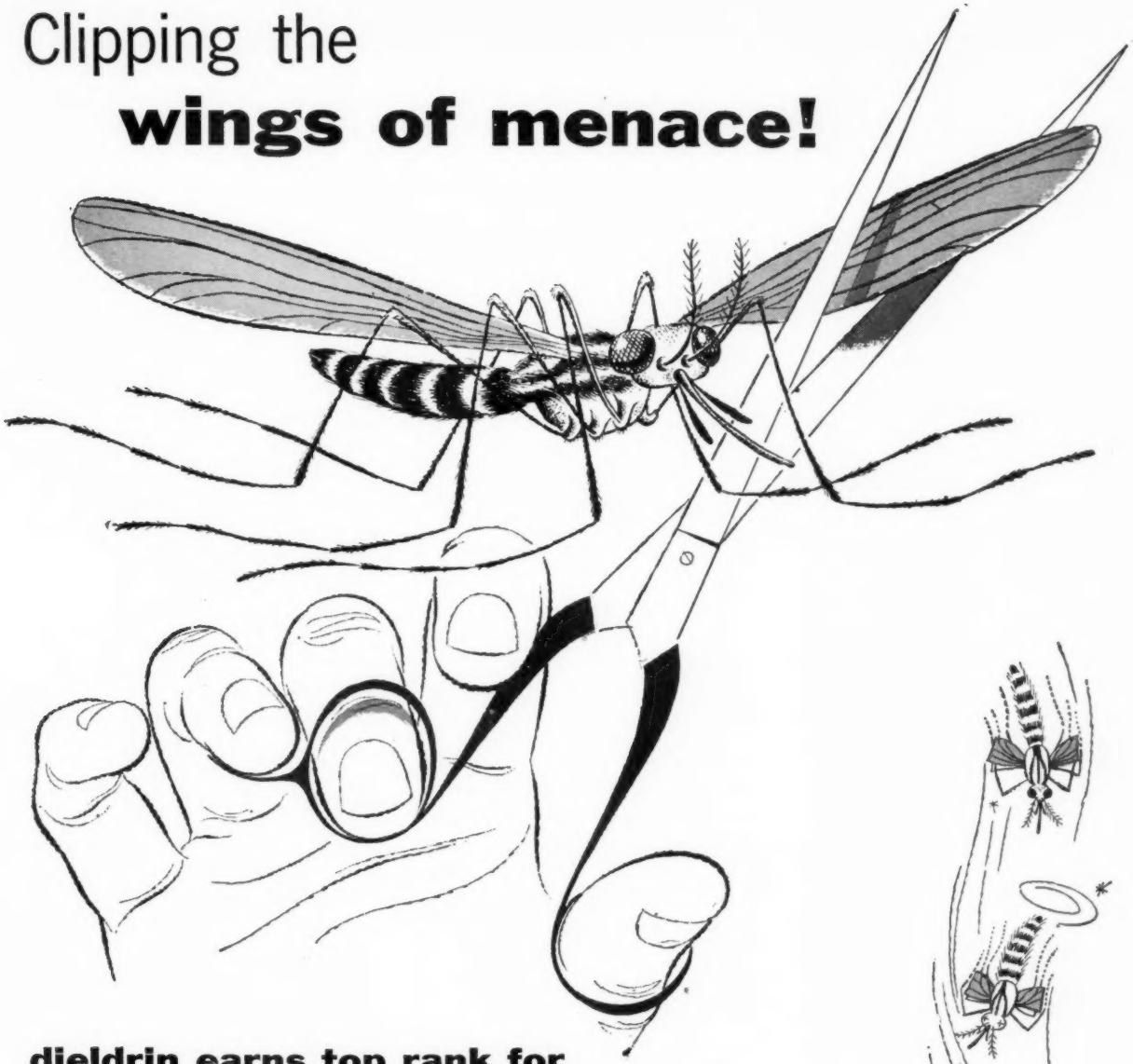

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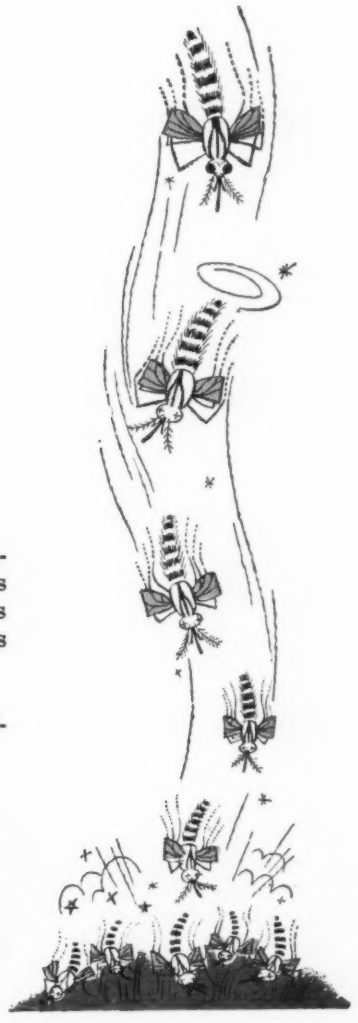

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(at Springfield, Illinois)

By **ARTHUR W. GIBSON,** Sentinel Insect Control Laboratory, Springfield, Ill.

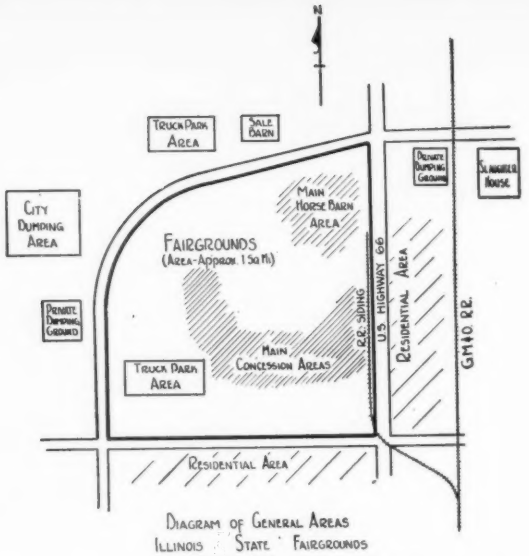


Diagram of General Areas
Illinois State Fairgrounds
Figure No. 1

ON JULY 1st, 1954, we were awarded the Fly Control Program on the State Fairgrounds, just north of Springfield, Illinois. Because this was such a major undertaking, especially with the Fair opening on August 13th, time was against us if we were to set up a complete control program.

Area covered by the Fair proper was 600 sq. acres having both permanent buildings and temporary quarters installed for concessionaires, overflow of livestock, etc.

Our survey revealed major fly sources outside the Fairgrounds would have to be considered because flies might migrate from those areas to the fair site. These areas were the City Dump, two private dumps, a slaughterhouse and an auction sale barn (Fig. 1, Map). Within the grounds breeding areas would be livestock kept on the grounds, livestock manure, garbage and rubbish from concessions, and restaurants operating on the property. Another important fly breeding source would be the trucks bringing livestock to the Fair. In the past, most of these were parked on the grounds until after the Fair was over. Railroad cars bringing livestock in would also be a problem.

After we had been awarded the job, a meeting was called to discuss the procedures with Mr. George Hockenyos and myself of the Sentinel Laboratory; and Mr. L. D. Hudson and Mr. James Williams, representing the State Dept. of Public Health, Division of Sanitary Engineers. The meeting was held with Mr. Strother G. Jones, General Manager of the 1954 Illinois State Fair. The following program was set up:

Control of flies at the Fair would depend upon a proper balance between sanitation and the correct use of chemicals. It was pointed out savings in chemical control would be affected by proper sanitation measures, if enforced. It was also emphasized that there is a point of poor sanitation at which no amount of chemical control would suffice to keep the fly population at a reasonable level.

• Sanitation Program Established

The following fly control and sanitation measures were selected:

1. Change existing City Dump to a sanitary land fill and abandon it entirely for a period of at least two weeks before opening of the Fair and all during the Fair proper.

2. Eliminate fly breeding on all livestock trucks that come to the Fair. This included trucks carrying show horses, race horses, cattle, hogs and other livestock. A station was to be set up where all trucks, after unloading their stock, would be treated with a suitable larvicide. A system was devised to place a window sticker on each treated truck and park it on a lot as far away from the grounds as possible. This operation called for the cooperation of the Fair Management, Traffic Department and Livestock Division Superintendents.

3. Handle railroad livestock cars to prevent any emergence of adult flies or the deposit of material which contain immature stages of flies. One man was to be on duty at all times at the railroad siding to be sure cars would not stand on the grounds long and to prevent the dumping of manure in that area. This man was to have contact with the spray crew to assure the use of insecticides when needed.

4. All poultry crates and other equipment for getting birds into the poultry building were to be cleaned, sprayed with a larvicide, and stored away from the building proper. It would be necessary to examine exhibitors' displays to be sure they did not bring fly breeding sources with them.

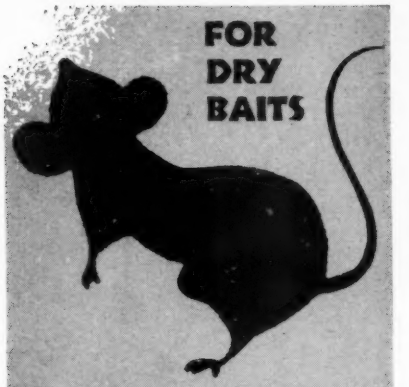
5. Check the method of bringing animals into the Conservation Building to be sure fly breeding material and immature stages of flies were not brought into the area.

6. Treat all garbage cans with a disinfectant prior to Fair time. During the Fair clean cans daily and treat them as needed to kill and repel flies.

7. Provide the services of one or more roving inspectors to locate and

1. Truck spraying station was set up to larvicide bed of every truck bringing in livestock.

2. Truck beds were torn apart and larvicided with 600 lbs. pressure for thorough penetration.



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control unusual fly sources during the Fair period. These men were to be furnished by the State Division of Sanitary Engineers, who were to set up counting stations and help us locate the fly breeding "hot spots."

• Chemicals Selected

Once this program was set up, we in the Laboratory went to work testing baits and larvicides which could be used with safety to carry out that program. Our final decision on fly bait was to use 1% malathion and sugar (12½ lbs. per 100 gal.) bait for overall spraying, and 2½% water miscible coal tar disinfectant (Phenol Compound) with ½% malathion for the larvicide. As an additional larvicide we would use 2½% water miscible trichlorobenzene in spots where it would not affect animals. For space spraying with our Dyna-Fog Jr., the recommended Pyrethrum base sprays were specified.

The power equipment used on this job was a Meyer 400 gal. tank sprayer capable of delivering 20 gal. per minute at 600 lbs. pressure, a smaller Meyer 125 gal. tank, 7 gal. per minute at 400 lbs. pressure, and B & G 1 gal. hand sprayers for light touch-up work.

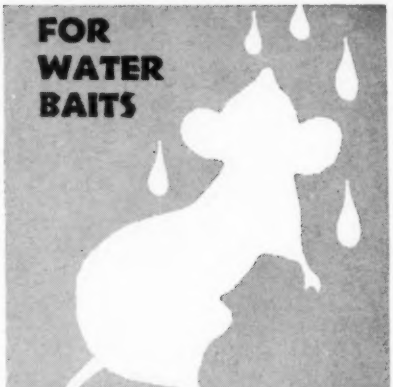
• Procedure

Two weeks before the opening date, we started spraying all buildings on the grounds with the malathion bait spray. Application was at the rate of one gallon to 300 sq. feet of wall space. Side walls, entrances and all overhead beams, pipes and light wires were treated. In hog and sheep barns the pens themselves were sprayed with the bait spray. In the poultry building, tables upon which cages were to be set were sprayed on the under side, and their legs were sprayed. In this building all overhead beams and conduit pipes were treated. Our object was to spray all the resting places in the individual buildings where flies would be.

• No "Dumping" Signs Posted

In the meantime surrounding dumps were closed and signs posted to the effect there would be no dumping until after the Fair had closed. Larviciding was done at these dumps and at the Auction Sale Barn. The slaughterhouse stepped up its own fly control program to lower migration from that area. Malathion bait was also applied on those areas wherever we thought it would be of any value to the overall fly control program.

We then set up the truck



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3. **Seeing servicemen spray** around food counters kept merchants and public happy, fly-free.

4. **Sentinel president, George Hockenyos,** daily searched for larvae breeding areas during fair.

spraying station (see illustrations 1 & 2) and arrangements were made to give each driver, upon entering the grounds, an instruction sheet which told him to unload his stock and report to the station to have his truck sprayed.

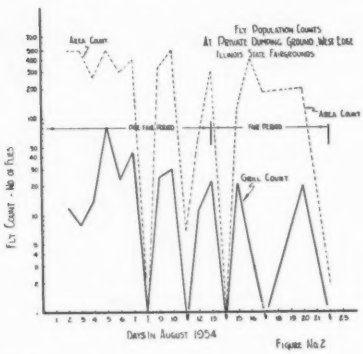


Figure No. 2

This station was maintained on a 24-hour schedule until all livestock was on the grounds. As a truck pulled up to the station one of our men would get into the bed of the truck and, using the 600 lb. pressure line, literally tear up and soak the entire bedding of straw and manure with larvicide. This stopped all fly breeding in livestock trucks for the entire Fair period. After spraying, a sticker was placed on the windshield showing it had been treated. The truck was then ready to be parked in a designated parking lot.

The number of animals brought to the grounds in trucks and cars was amazing and should be considered to bring out the tremendous size of this job. Here is a breakdown:

Cattle	2835	head
Horses and mules	1394	"
Goats	259	"
Sheep	1345	"
Swine	3379	"
Poultry	3177	"

A grand total of 12,389 animals on the grounds all at one time!

The Division of Sanitary Engineers set up its counting stations August 2nd and maintained them until the Fair closed, August 22nd. Advantage of this system is that not only do you have a daily count of live flies, but you also have the "dead" count to show whether or not your materials are working. When live counts, in any given area, would start to rise we had the opportunity to look at once for the "hot spot" or breeding place causing this increase. (Ill. No. 4) We found this very valuable in getting good control on an

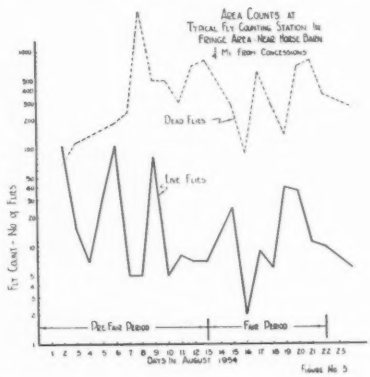


Figure No. 3

area program as large as this. When the breeding spot was found and treated, live counts would always decrease.

Fig. 2 shows fly counts taken on a dump west of the grounds. In this count both grill and area counts were taken, since most of the flies on the grill would be common house flies or blue bottle flies. The area count spotted all types of flies, including those which do not spend much time on the lower surfaces.

Fig. 3 charts the counts taken in the horse barn area showing number of live flies in comparison to the dead count. Area count only was used here since we were interested in spotting stable flies as well as the others.

Fig. 4 records a daily count taken at one of the many food concessions in the heart of the Fairgrounds. This chart in particular shows the effectiveness of our control program. When you realize that the food stand counter top was about 80 ft. long, the average count of about one fly during the Fair was remarkably low.

Additional larviciding was done to soil in each area designated for the piling of manure that would be picked up and hauled off the grounds. All manure was taken and buried about three miles from the Fair site. Spots outside livestock barns where manure was piled were treated with either the coal tar and malathion formula or with trichlorobenzene material. Trucks, into which the manure was loaded, were sprayed daily.

• Spray Food Stands Daily

In addition to all the above work, we had two of our service-

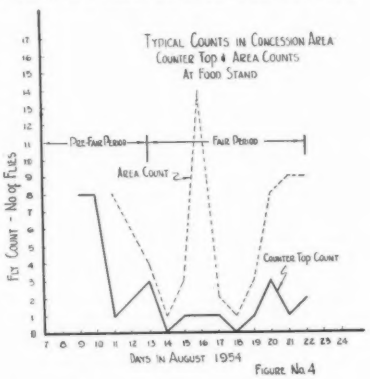
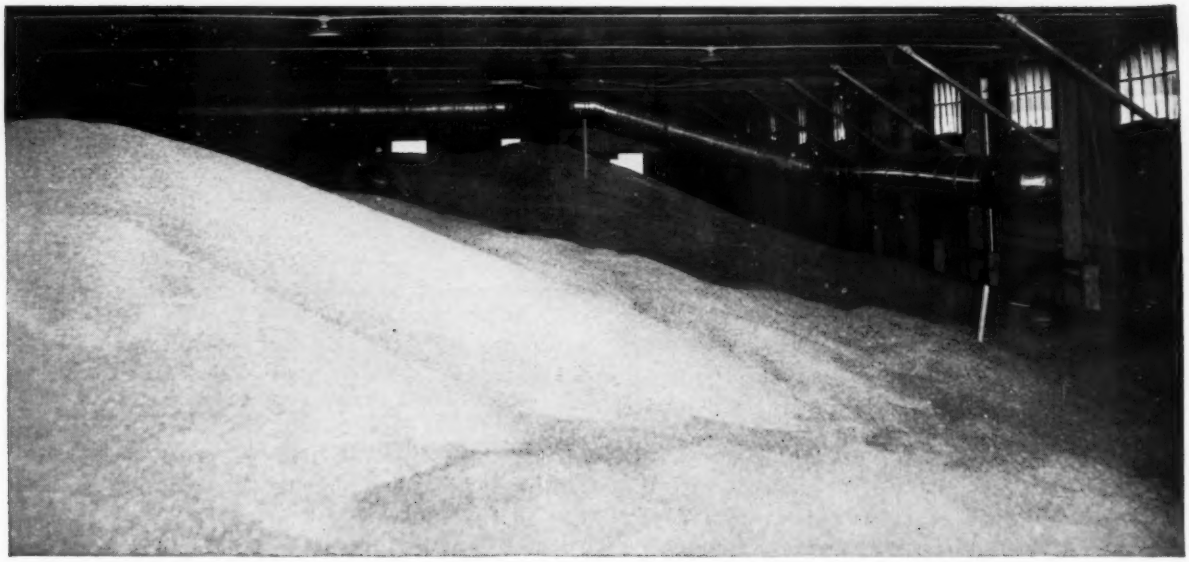


Figure No. 4

men, using 1 gallon B & G sprayers, visit each food concession daily and touch-up the stands with malathion and sugar bait. (See illustration No. 3.) This follow-up work paid off in establishing good public relations, not only with concession owners but also with the general public. Just the sight of a man spraying for flies has a psychological effect upon

(Continued on page 54)



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Recognition of Insect Damage

by Professor John V. Osmun, Purdue University

IN THIS SECOND SECTION we'll examine damage to fabrics and paper. Part One, in January, covered clothes moths, carpet beetles, hide beetles and termites. When the pest is not present, all you have left to go on are the signs of destruction left behind. These photos of frequently encountered damage will help you prescribe proper control methods. To use the key, first look at the kind of material injured, then refer to the appropriate section; second read over the various descriptions in that section until the pest which caused the damage is determined. In Section Three we'll look at damage to wood and wood products.

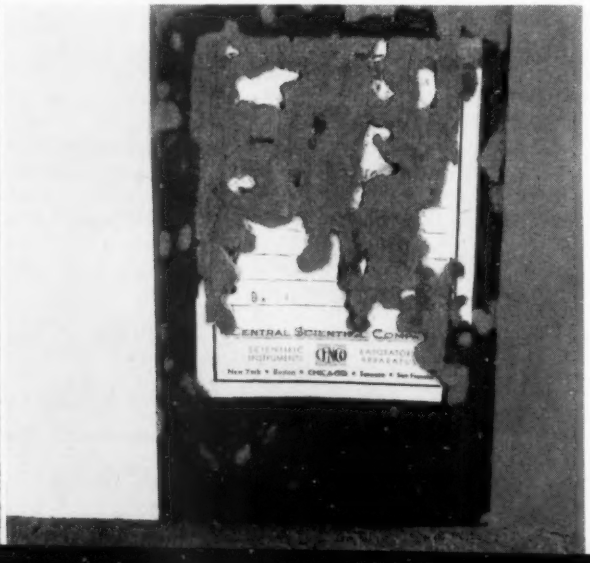
Section Two: **Synthetic Fabrics, Finished Cloth, Glazed Paper, Books And Their Bindings**

1. Surfaces of material lightly etched on the surface in irregular patterns, or if extensive, entire surface may be affected. Samples may or may not have small holes. Occasionally present are minute, iridescent scales, pieces of cast skin, and hard irregular, small (less than 1 mm.) pellets. Preferred materials include glazed paper, cellophane, rayon, linen, sized cotton, and wall paper ..... **Silverfish and Firebrats** (Figure 11)

2. Surface of material roughened from chewing, the roughness having been caused by pulling action. No prominent teeth marks as described in 3. Occasional fecal pellets, dark, smooth, and with six more or less distinct longitudinal ridges. (Pellets of some species nearly as large as those of a mouse). Fecal deposits may often leave only dark smears or stains ..... **Cockroaches** (Occasionally crickets) (Figure 12)

Figure 11. Extensive **firebrat feeding** on surface of book.

Figure 12. **Oriental cockroach** damage to binding of books. Note dark blotches of fecal matter, and pulled effect on exposed fabric.



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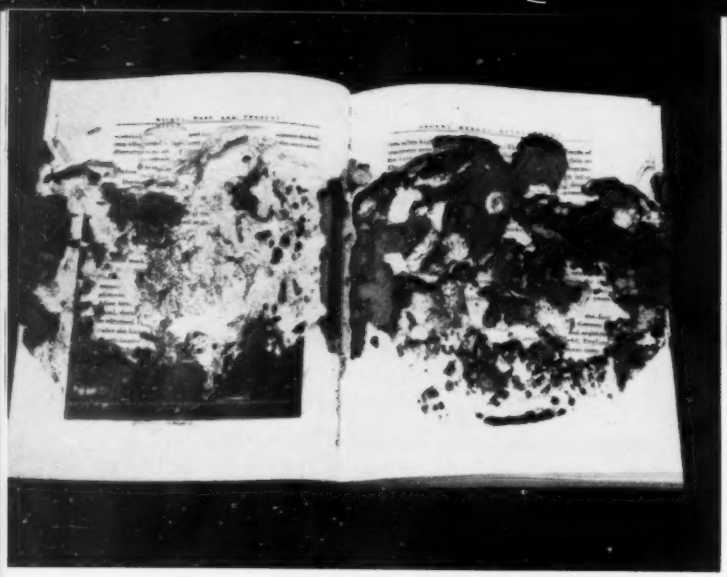


Figure 13. Subterranean termites did extensive damage to this book. It must have been heavy reading; the book is about nickel.

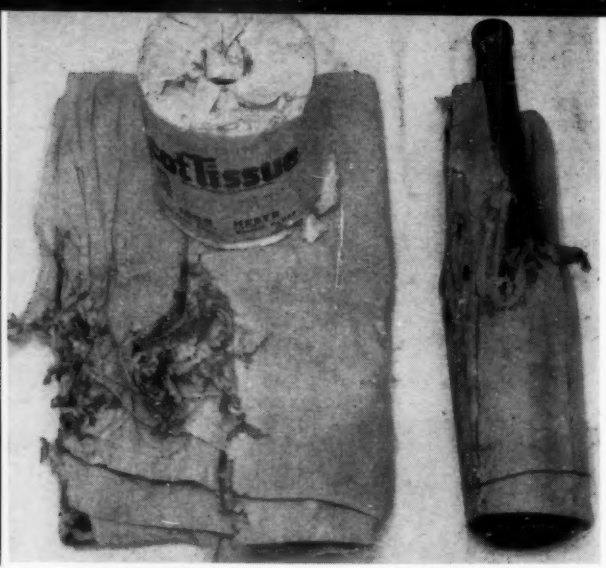


Figure 14. Subterranean termite damage to cotton cloth, paper and cardboard.

3. Edges of books and stacks of paper distinctly chewed with significant loss of material. Often show teeth marks; fecal pellets may be present ..... **Rodents**

a. Teeth marks 1/32″ wide; pellets 1/8-3/16″ long ..... **Mice**

b. Teeth marks about 1/16″ wide; pellets 3/8-1/2″ long ..... **Rats**

4. Books penetrated by small buck-shot holes, displaying on the inside numerous tunnels. No mastic material ..... **Drug Store and Cigarette Beetles**

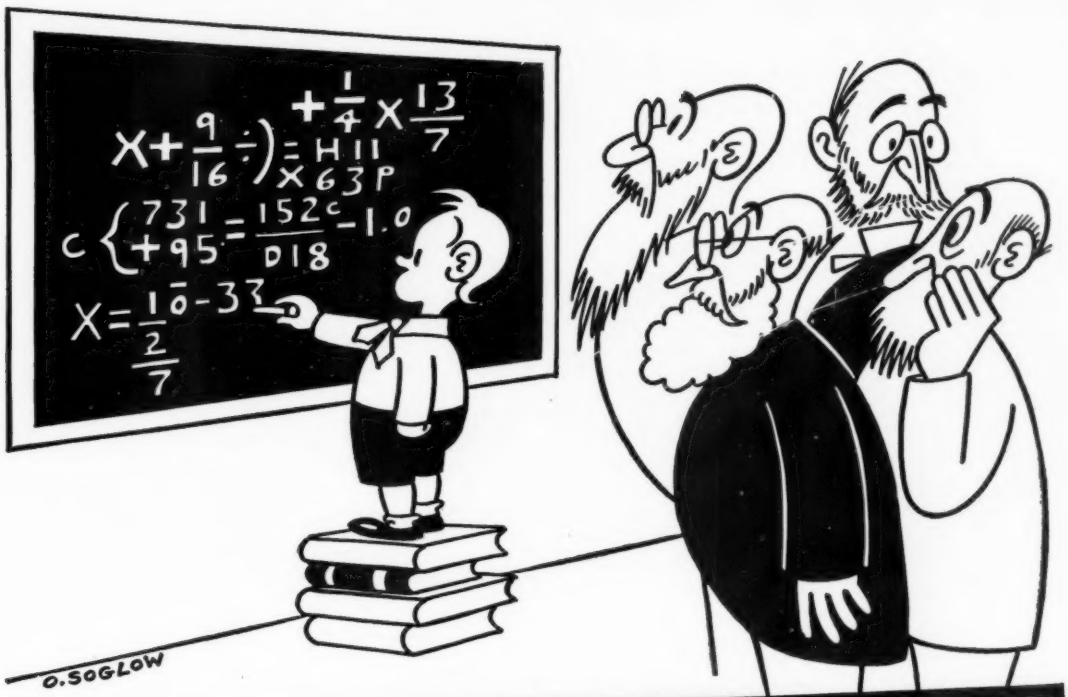
5. Books, cotton cloth, and stacks of paper penetrated by large, irregular tunnels lined with a large or small amount of hard, coarse, and usually well stuck mastic-like frass. Books occasionally found with exploratory tunnels similar to damage of drug store beetles ..... **Subterranean Termites**
(Figures 13, 14, 15)

6. Large areas hollowed out of books or stacked paper. Sides of excavation rounded. No frass or sawdust present, but surface may be stained in places .. **Carpenter Ants**
(Figure 16)

(To be continued)

Figure 15. Subterranean termites penetrated this stack of heavy paper. Crevices contain hardened mastic material.

Figure 16. Nesting carpenter ants damaged this book. Note rounded sides of excavation and lack of mud-like deposits. (Book from Henry Ford Library.)



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PEST CONTROL magazine

Two Los Angeles pest control firms provided seven men to cover million cubic foot warehouse with 100,000 square feet of gastight vinyl-coated nylon and sheet polyethlene tarpaulins prior to introducing some two and a half tons of methyl bromide in largest fumigation job ever undertaken. Operation was to establish low-cost method for exterminating khapra beetles.

Ground around building was saturated with malathion to kill beetles outside building. **Larvae** were rolled in cardboard, packed in screened test jars and placed in warehouse.

Mammoth Government Experiment At Imperial, California, Reveals

Methyl Bromide Dooms Khapra Beetles

EARLY IN JANUARY experts from Washington, California's Department of Agriculture, and the University of California swarmed into the small town of Imperial, California, to conduct the biggest fumigation job for khapra beetles ever undertaken. Their purpose: find the best method to kill this menacing pest which is threatening stored grain. Preliminary results from this vast undertaking show methyl bromide does the trick.

Khapra* beetles have suddenly loomed into becoming the number one object of scientific extermination by the U. S. Department of Agriculture's Stored Products Insects Division. It is described as a potentially serious pest of stored products throughout the entire southern half of the United States, and possibly the whole nation. In other parts of the world, where it is established, it is regarded by authorities as the most destructive grain pest known.

The fumigation was part of a program to determine if such control procedures will be practical and economical. Information on methods and dosages are needed to write regulations under which commodities from infested properties may be permitted to move.

The entire test was carried out under the direction of H. M. Armitage, chief of the Bureau of Entomology, California Department of Agriculture, who had the assistance of Earle T. Gammon, Cyril Gammon, and Dan Robinson of that department. The USDA was represented by Elmer Mayer, stationed at Fresno, and Garth Spitler of the khapra beetle investigation project at Mesa, Arizona.

• Warehouse of Corrugated Iron

Fullest cooperation was extended by Neil Bundgard, owner of the Continental Warehouse Company whose premises were the site of the test. Operations were supervised by Hector Maclean and Karl Hassler of Neil A. Maclean Company, Los Angeles, Walter Lantz of Admiral Pest Control and Ed Stanley of Stanley Pest Control, both of Los Angeles. Two companies which supplied the methyl bromide, The

"Sampling" tubes fed to Gow-Mac testers enabled experts to watch concentration of fumigant. Shown are (left to right) Earle Gammon, Dr. Lloyd Vincent, Dr. David Lindgren, Karl Hassler, and Dow representative Harold Lembright, at outside field set-up.

* The word khapra means "brick" in India. The beetle was so named because its hiding larvae were noted filling the cracks of earthen bricks of which warehouses were constructed in that country.

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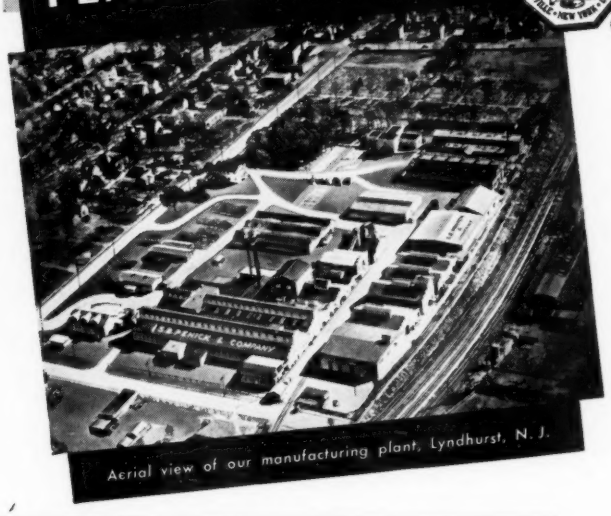

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Adjoining tarp edges were rolled together, clamped with spring clamps making cover gas tight. 100% kill proved method effective.

Saran tubing from representative areas of warehouse collected samples for periodic gas concentration analysis during the entire test.

FCO Ed Stanley, right, and USDA observer, **Garth Spitler,** prepare to release the first "cold" methyl bromide inside huge building.

Dow Chemical Company and Eston Chemical Company, also had their representatives on hand.

Built of corrugated iron on a cement slab floor, the warehouse is 120 ft. wide by 280 ft. long. Height to the eaves is 20 ft. Roof is a double hip type, the peaks of which rise another 12 ft. from the eaves with a flat roof strip 20 ft. wide between hip construction. This portion of the roof is covered with rolled roofing. A 30 ft. by 60 ft. tower with a flat roof on top rises 65 ft. from ground level at one corner. Building was substantially empty at the time of fumigation except for about 40,000 cubic feet of sugar in hundred pound bags and 100 bags of certified barley which were impractical to move.

• Job Takes Six Days

Conducted over a six-day period, the Imperial study began with saturation of a five acre ground area around the million cubic foot warehouse with a malathion spray to kill khapra beetle adults, larvae or pupae which might be hidden in surface debris. Next step was wrapping the huge building in a cover of gastight tarpaulins. This required more covering material than the two cooperating pest control firms could supply, so additional yardage was purchased.

Pest Control's on-the-spot observer told us, "Outside of the weather, the job was, for the fumigators, tedious and lengthy, but not unusual or difficult. The weather wasn't good. It rained all day Sunday and Monday before the job. Several truck loads of gravel had to be dumped around the warehouse to make it possible to get trucks up to it. All went well Tuesday and Wednesday and til noon Thursday. At 2 P.M. Thursday we had quite a little shower which drove all the company of some three dozen observers back into town. From 4 to 7:30 P.M. it came down in buckets.

"The tarps all held intact during the storm. In fact, the thorough wetting that everything received contributed to the good retention of gas. Five pounds of methyl bromide per thousand cubic feet were introduced. Over the entire 48-hour fumigation period 2.5 tons (5,161 pounds) of the fumigant were used. Measurements of gas concentration taken with a Gow-Mac Gasmaster instrument 48 hours after the first introduction of gas showed an all-station average of four pounds or more cubic foot were left.

"The water sealed up all needle holes and small openings in the tarps. It also perfectly sealed the rolled joints by capillary action. Besides, the water filled the ditch around the building in which edges of the tarp were buried. If that didn't hold the gas, then a bell jar would have been no better!"

• And Three Days to Cover

The contract accepted by the two pest control firms called for covering the entire structure with tarpaulins and the introduction of methyl bromide. Fans to secure adequate circulation were provided.

Preparation and covering the building required the time of seven men for three days. Vinyl coated nylon tarps were used to cover the building at points of strain, such as the eaves and the 65 ft. clear fall from top of the tower. Polyethylene sheeting was used for the roof and curtain covers from eaves to the ground. About 100,000 square feet of covering material was used. Individual sheets of tarps were joined by rolling together and fastening

The khapra beetle (*Trogoderma granarium* Everts), native to India, Ceylon and Malaya, was discovered in the United States in Tulare County, California, in November 1953. Further investigations by the California Department of Agriculture revealed the beetle was present as early as 1946 but was locally assumed to be one of the other similar species commonly found associated with grain storage and therefore never submitted for accurate identification. Since fall, 1953, extensive surveys of more than 1,000 premises have shown that less than 10% were infested. These are found in California, Arizona, New Mexico and the adjoining district of Mexicali, Mexico, according to L. J. Padgett, of the USDA, who conducted the survey.

Quarantines against the insect have been established in Kansas, Oklahoma, Colorado, Texas, Nevada, Arizona, California, New Mexico, and Idaho. During December, 1954, the USDA held hearings on the establishment of a federal quarantine of infested areas. Once federal quarantine is established, state quarantines will probably be dropped.

For a description of the khapra beetle see *Pest Control*, November 1954, page 9, "Here's What Newly Found Khapra Beetle Looks Like."

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Walter Lantz of Admiral Pest Control, Los Angeles, turns on the first "hot" gas in the test fumigation. Because atmospheric temperature was a surprising 40°, 80% of the gas was heated.

with metal spring clamps. Covers were protected from wind damage by tying down with four inch burlap webbing. At ground level, tarps were sealed in a trench a foot deep and covered with earth.

Supervising authorities set the dosage of methyl bromide at five pounds per thousand cubic feet. This dosage appears to be extremely high, our reporter says, but the object was to secure complete kill of test insects, he explained. (The rate used was two and a half times amount necessary to kill all beetles under laboratory conditions.)

Because 40° weather prevailed, of the some 5,000 pounds of fumigant used, 1,000 were applied "cold" by allowing the liquid to escape through spray nozzles fastened to the rafters and connected by hoses to the cylinders. The remainder was introduced "hot". Five heat exchangers were used in this part of the operation. The heat exchangers were small, gas-fired steam boilers. Liquid gas was introduced into copper coils inside the steam chest and the vapor phase was released through ordinary ¾" garden hose connected from the boiler to suitable places inside the building. About three hours were required to release and evaporate all the initial charge.

• 40 Inside Test Spots

Although the Imperial warehouse was already infested, live khapra beetles were placed in about 40 spots inside in escape-proof cloth bags and jars to determine whether the concentration of gas would eliminate the pest throughout. All life stages of the beetle were used. Five thousand feet of quarter-inch saran tubing conveyed gas samples from 20 spots inside to Gow-Mac Gasmaster analysis instruments outside the structure. Caged insects were placed near the end of the tubes so mortality could be correlated with the gas determined to be present as indicated on the instruments.

As another check, two small boards, bolted tightly together with larvae between and coated with heavy asphalt emulsion on three sides to test penetration of the gas into the crack of the fourth edge, were placed in escape-proof fabric bags and taped into position. Screen-capped jars containing barley seed and rolls of single-faced corrugated cardboard carrying larvae were also placed in the building.

In spite of the very heavy rain and winds up to 30 mile gusts, the building remained "sealed." As gas was introduced the tarpaulins near the ground swelled out some six feet from sides of the building, and remained so swollen for some 24 hours. This appeared to be good evidence that pressure of the gas was being well maintained. The analysis instruments confirmed this conclusion.

In this pioneer test, 30 days after the methyl bromide was introduced, and the building cleared by ventilation, entomologists counted 491,191 khapra beetles as larvae, pupae and adults, representing all locations within the confined space, and all conditions under test. Mortality was 100%.

If the final check-up supports these 30-day results, method used on the warehouse in Imperial, California, may encourage an intensive effort to treat all known khapra beetle infestations in this country with this procedure.

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Two New Organic Phosphates

by
DR. ROSMARIE von RUMKER
Director of Research
Chemagro Corporation, New York, N. Y.

Dipterex and Chlorthion

THE INVENTION of the organic phosphate insecticides is one of the most fascinating developments in the inter-related field between chemistry and biology in the modern history of sciences. It began in 1935, when systematic research in this field was started in the research laboratories of Farbenfabriken Bayer, of Leverkusen, Germany, by Dr. Gerhard Schrader[12]. Within the two decades that have elapsed since that time, and especially during the last ten years, the organic phosphates gained world-wide importance as insecticides and acaricides. Moreover, the early discoveries in organic phosphates gave impetus to a vast research effort in the field of physiology, in which scientists from practically all over the world have participated. The results thus obtained have greatly contributed to the knowledge of the mechanism of transmittal of nervous impulses in man and animals. These achievements are considered so important to the general advancement in science that physiologists or members of the medical profession sometimes are quite surprised to learn that the organic phosphates occupy a place in modern economic entomology which we are inclined to consider just as important as their role in the field of physiological research.

• Organic Phosphate Action Understood

Due to these extensive basic research efforts, the mechanism of action of organic phosphates in biological systems is much better understood than that of most other chemicals used as pesticides. This is very encouraging and reassuring to all who handle such materials in the course of their production, formulation, distribution and application since an understanding of the mode of action of any potentially hazardous or dangerous chemical or device is essential for the development and observance of suitable precautionary measures and antidotes.

The organic phosphates are assumed to exert their effects in biological systems by inhibiting cholinesterase, an enzyme which plays an important role in the transformation of certain nervous impulses into muscular action in the living organism. The normal cholinesterase level in the organism, after administration of a toxic dose of an organic phosphate to an experimental animal, can be restored by (1) in-vivo-hydrolysis of the phosphate-enzyme-complex, thus restoring the enzyme to its normal activity; or by (2) replacement of inhibited cholinesterase by formation of new enzyme, which appears to be a continuous process in the organism. Both processes may and probably do occur simultaneously. Complete recovery after acute poisoning from toxic doses of organic phosphates occurs within a relatively short period of time, varying from several hours to several days depending, of course, upon the dose administered and the severeness of the intoxication. It is important to know that the organic phosphates, according to all experimental evidence known to date, are not cumulated or stored in the organism.

The pest control and mosquito control fields have been added to the fields of usage of organic phosphates only recently. Most of the early organic phosphate insecticides, in addition to being toxic to insects and mites, were also highly toxic to animals. More recently, however, several products relatively non-toxic to man and warm-blooded animals were developed, thus disproving the opinion that high mammalian toxicity is inherent in this entire chemical group.

• Dipterex

Among these materials, Dipterex became widely known because of its exceptional performance in the control of flies, including resistant strains. The active ingredient in Dipterex is O,O-dimethyl-l-hydroxy- 2,2,2-trichloroethylphosphonate. This product, like many other organic phosphates developed by Farbenfabriken Bayer's research team under Dr. Gerhard Schrader, was first tested in 1952 under the laboratory code number Bayer L 13/59. Dipterex technical is a white solid, highly soluble in water, with a vapor tension similar to that of parathion. Its oral acute LD-50 to rats is approximately 500 mg/kg. (active ingredient). Unusually high fractions of an acute lethal dose were tolerated by rats in subchronic studies, and more than one-fourth of an acute lethal dosage daily was required to produce mortality of the experimental animals during a 60 day period of treatment.[3] Thus, Dipterex appears to offer a high margin of safety. The handling and application of Dipterex does not require respirators, protective clothing or other extensive precautions. Flies killed by Dipterex, eaten by livestock or pets, produced no ill effects. Nevertheless, as with any potentially hazardous substance, care should be exercised in its use.

The most spectacular feature of Dipterex in fly control is its extremely rapid knockdown action. A sugar bait type formulation containing 1% active ingredient developed wide commercial acceptance in 1954. This formulation, designed for easy, economical application without expensive equipment, has proved highly effective under a wide variety of conditions in many states, in killing flies in dairy and livestock barns, milk processing and holding rooms, poultry houses, hog pens, garbage areas, manure piles and similar situations. It can be applied as a dry bait, as a liquid bait, or as a varnish, painted in small strips on posts, sills, partitions and other places where flies tend to congregate [2,5,6,8,10].

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versity experiment stations proved that Dipterex does not affect the flavor of milk from dairies where it has been applied, and no traces of Dipterex were detected in such milk.

For fly control in the home, Dipterex is expected to become available this coming season in the form of a special device called "Fly Charmer," a device representing an entirely new and novel approach to fly control in confined spaces.

Another device tested with good success in 1954 in the United States, in Europe and elsewhere, is the so-called "Dipterex Fly Disk" (also known as "Tugon Fly Mat" in a number of other countries). This is a circular cardboard mat impregnated with Dipterex, designed to attract and kill flies.

There are indications that Dipterex will also gain importance in the control of mosquito larvae under certain conditions.

• Chlorthion

Chlorthion is another organic phosphate of a low order of mammalian toxicity, originated by Dr. Gerhard Schrader [13], which shows promise in the control of flies and mosquitoes. Chemically, the active ingredient in Chlorthion is O,O-dimethyl-O- (3-chloro-4-nitrophenyl) thiophosphate. Chlorthion technical is a yellowish brown, viscous liquid of characteristic, ester-like odor, and water-insoluble for all practical purposes. Its vapor tension is lower than that of parathion. The acute oral LD-50 of the Chorthion active ingredient to rats is 1500 mg/kg[4]. Chlorthion is available in experimental quantities as a liquid spray concentrate containing 4 pounds active ingredient per gallon, as a 25% wettable powder, and as a 3% dust.

Though Chlorthion does not exhibit as spectacular knockdown action as Dipterex, it has shown great promise as a fly control agent, especially in the form of a residual wall spray [8]. It appears that the wettable powder provides somewhat longer residual effectiveness than the spray concentrate, at dosages of 4-8 pounds of active ingredient per 100 gallons of water. Like Dipterex, Chlorthion is equally effective on resistant and non-resistant strains of flies. It has also been used very successfully as a 1% sugar bait formulation. In Europe, gauze ribbons impregnated with 15% Chlorthion (active ingredient), suspended from the ceilings of farm buildings such as dairy and livestock barns, are reported to provide effective, long-lasting fly control.

No traces of Chlorthion were detected in the milk of cows from treated dairies, nor was there any effect on milk flavor, testing laboratories have shown.

Chlorthion has also been found highly effective in the control of mosquito larvae and adults, including resistant strains [1,7,9,11].

Like Dipterex, Chlorthion does not require respirators, protective clothing or other comparable precautionary measures in its application.

Neither Chlorthion nor Dipterex is limited to the fly and mosquito control fields in their range of effectiveness. Both materials have shown great promise in pest control, especially against resistant roaches, and as agricultural insecticides. Comprehensive field tests have been conducted under

(Continued on page 56)

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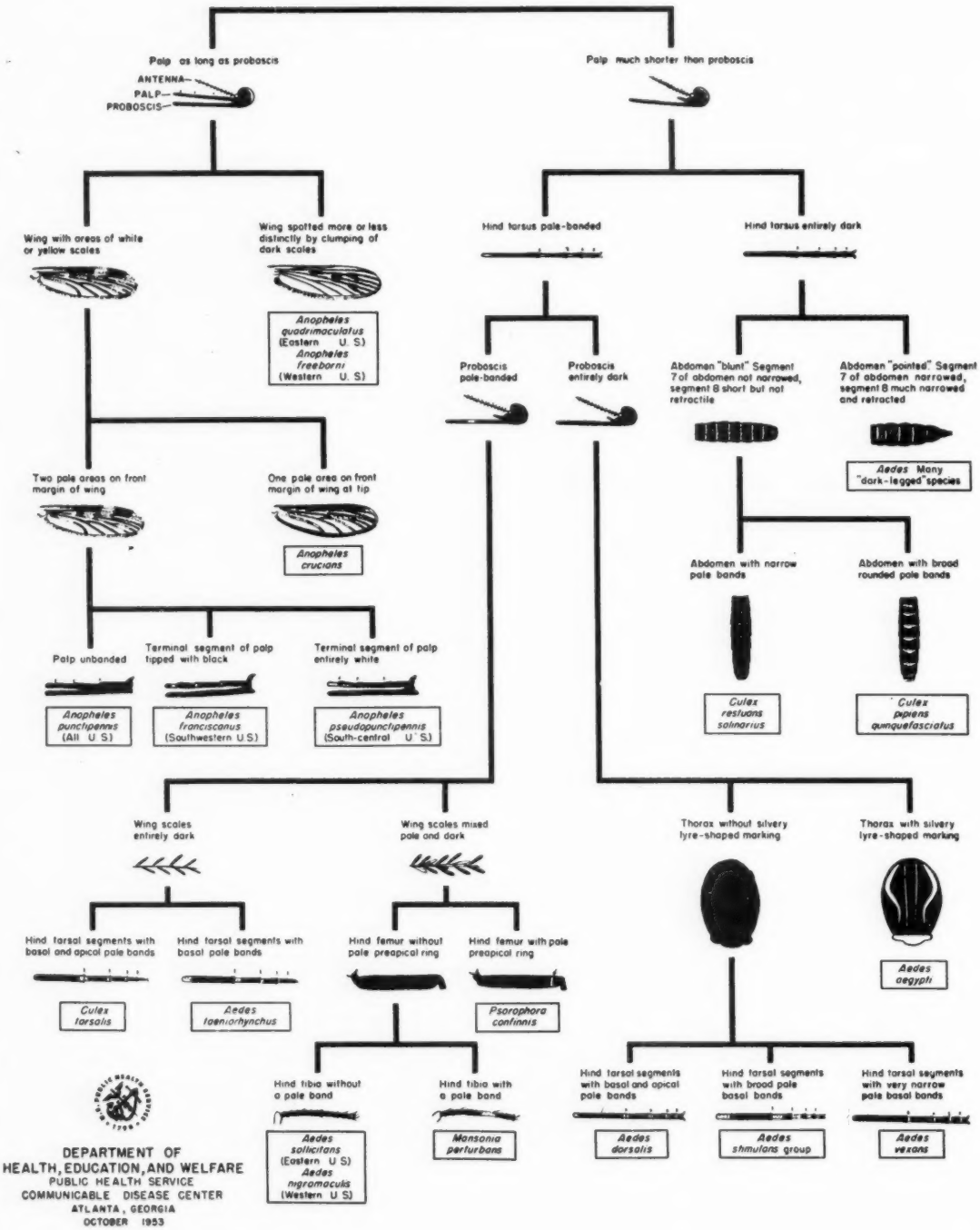
Palp as long as proboscis
ANTENNA
PALP
PROBOSCIS
Palp much shorter than proboscis
Wing with areas of white or yellow scales
Wing spotted more or less distinctly by clumping of dark scales
Anopheles quadrimaculatus (Eastern U. S.)
Anopheles freeborni (Western U. S.)
Hind tarsus pale-banded
Hind tarsus entirely dark
Proboscis pale-banded
Proboscis entirely dark
Abdomen "blunt" Segment 7 of abdomen not narrowed, segment 8 short but not retractile
Abdomen "pointed" Segment 7 of abdomen narrowed, segment 8 much narrowed and retracted
Aedes Many "dark-legged" species
Two pale areas on front margin of wing
One pale area on front margin of wing at tip
Anopheles crucians
Abdomen with narrow pale bands
Abdomen with broad rounded pale bands
Culex restuans salinarius
Culex pipiens quinquefasciatus
Palp unbanded
Terminal segment of palp tipped with black
Terminal segment of palp entirely white
Anopheles punctipennis (All U S)
Anopheles franciscanus (Southwestern U S)
Anopheles pseudopunctipennis (South-central U S)
Wing scales entirely dark
Wing scales mixed pale and dark
Thorax without silvery lyre-shaped marking
Thorax with silvery lyre-shaped marking
Aedes aegypti
Hind tarsal segments with basal and apical pale bands
Hind tarsal segments with basal pale bands
Hind femur without pale preapical ring
Hind femur with pale preapical ring
Culex tarsalis
Aedes taeniorhynchus
Psorophora confinnis
Hind tibia without a pale band
Hind tibia with a pale band
Aedes sollicitans (Eastern U S)
Aedes nigromaculis (Western U S)
Mansonia perturbans
Hind tarsal segments with basal and apical pale bands
Hind tarsal segments with broad pale basal bands
Hind tarsal segments with very narrow pale basal bands
Aedes dorsalis
Aedes shmulans group
Aedes vexans
DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
COMMUNICABLE DISEASE CENTER
ATLANTA, GEORGIA
OCTOBER 1953

Servicemen's Instructions for Fly Control

BECAUSE FLY ELIMINATION is one of the more difficult phases of general pest control work, a large East Coast pest control firm has compiled a set of special instructions to guide its servicemen.

This company believes in training each man to apply enough chemical on surfaces to give residual kill, but not so much to cause runs, blooming, or stains of any kind.

Instructions include such procedures as covering objects that might be harmed by the chemical, inside treatment, outside application, how to handle breeding areas, and steps to take after the job is finished.

Here's what the company tells its fly control crews:

• Protect Objects From Chemical

Before application of insecticides cover all cellophane containers, plastics, cotton bagged materials, aluminum or stainless steel pots and pans, light bulbs and glassware. Edibles, such as exposed fruit and vegetables, meat, and frozen food must also be covered.

While a helper takes care of routine precautionary measures, the senior serviceman inspects premises to determine quickest and most logical method of spraying the entire building. Hose should be carried to the point furthest from the service truck to ascertain length that will be needed.

Approved inside spraying procedure is for the operator to start at the most distant point from the truck and work back towards the building entrance, using the easiest and most logical pattern of application. This will depend on the general architecture of the building.

• Spray Interior First

Interior spraying applications on finished surfaces are generally made with a Spraying Systems 8001 tip. Using between 150-200 pounds pressure, the wand is held so the nozzle is approximately 12-18 inches from the surface being sprayed. On ceiling and wall work this may necessitate the use of a long wand. An operator must determine his rate of speed so he will get even coverage with complete wetting, but no run-off.

Spray all walls and ceilings with a long extension, the company stresses, paying particular attention to anything which hangs from or adjoins the ceiling that flies might alight on. Some of the most common fly resting places are pipes, cords, signs, wires, pillars, and posts. Areas around ceiling lights, windows, and skylights should receive particular attention.

Short three or four foot wands are best for spraying around meat, fish, and bakery goods counters because the operator has better control over application of the chemical. Short wands are also good for spraying potential fly breeding areas such as bottoms of tables and meat blocks.

• Outside Treatment

Outside the structure spray all areas around windows or doors for a distance of about ten yards in every direction. In addition, treat shrubbery, grass, fireplugs and all similar objects near the building. Servicemen are advised to let down awnings and spray well, and to pay close attention to outside lights.

Most important outside fly resting areas are garbage cans, refuse receptacles, screen doors, incinerators, and storage areas for soda, beer, or other bottled or cased materials. Spray these locations very heavily.

Exterior spraying should generally be made with a Spraying Systems 8006 tip, holding the nozzle 12-18 inches from the surface, at approximately 150-200 pounds pressure.

• Soak Breeding Spots

Known breeding spots should not be sprayed but **soaked** with chemical. Such areas near the premises are generally garbage pits, manure piles, cesspools, incinerators, fermenting weeds or grass, or any deposits of decaying animal or vegetable matter.

The firm doesn't believe the job is over when the spraying is finished. First, the hose must be neatly rolled and all papers spread for protection picked-up.

Then check to make sure no tools are lost or mislaid. And get a signed slip from the building owner, as a receipt for service performed.

Final important point stressed by the company is that the servicemen make notes on a fly inspection form of any violation of good preventive fly control measures such as lack of screening, poor garbage storage, lack of sanitation, etc.

While these recommendations are not perfect, this East Coast firm feels if they are conscientiously followed employees will do an effective fly control job with a minimum of time, confusion, and damage.

DDVP Too Toxic Says NPCA

DDVP, newest phosphate for resistant flies, is considered too toxic for use by the pest control industry at the present time, says the National Pest Control Assn. According to the NPCA, acute oral LD 50 of DDVP to rats is about 25 mg. per kg. Thus, the hazard involved in handling this material appears to be 8 to 10 times less than with parathion but about five times more than that of Diazinon.

DDVP was developed by chemists at the Savannah, Ga., laboratory of the Communicable Disease Center (PC Mar. '55, p. 50). It is not commercially available at the present time.

AMCA Proceedings Available

Proceedings of the American Mosquito Control Assn. meeting in Toledo, Ohio, last fall on "The Use of Fogs and Mists for Adult Monsquito Control" are now available to PCOs.

For copies of this 66 page booklet just send $1.00 to P. Bruce Brockway, Jr., Superintendent, Toledo Sanitary District, 5015 Stickney Ave., Toledo 12, Ohio.

A Section of PEST CONTROL magazine

TERMITES and other enemies of wood

Biology And Habits Of Termite Species Found In Florida*

By DR. E. M. MILLER
University of Miami, Coral Gables, Florida

Successful termite operations are founded upon the operator's adequate knowledge of the biology of the pest he seeks to control. No matter how much termite biology he knows, the TO has the opportunity to increase this information through on-the-scene observations.

TOs should understand these three aspects of termite biology before they attempt control: (1) moisture requirements, (2) swarming dates, and (3) rate of colony activity and growth.

● Moisture Requirements

Familiarity with termite moisture requirements is obviously important in selecting control measures. For example, it has often been the experience of operators that treatment for subterranean types misfires if drywoods are present. And although some people advertise tent fumigation as a cure-all for everything, it turns out in experience that while it is good for drywoods it does not often succeed for subterranean forms.

Moisture requirements of Florida termites appear in Figure 2. The species are arranged to show relative moisture needs. Those closest to the moisture source require the most moisture, those farthest away the least. For some non-subterranean species such as **Prorhinotermes** and **Neotermes**, the moisture needed may come, not from the ground, but from the roof leaks, plumbing, or rain seepage through walls. **Neotermes** often infests living trees and gets its moisture from the sap.

The differences between so-called "subterraneans" are not often recognized, but they are real, and some of the puzzling situations pointed out by operators can best be understood in terms of this variation.

Flavipes definitely needs more moisture than **hageni**. Though subterranean, **hageni** often invades house framework up to the second or third story. Even when cut off from moisture, it will exist a long time and may give off "swarmers" from such levels after a "subterranean treatment." I have found them thriving in conditions as dry as those in which furniture termites live, and they seem to do well as long as their galleries are unbroken.

Subterranean termites do not need ground contact if they get adequate moisture elsewhere. I found them on the roof of a tall Miami hotel where they were obtaining moisture from leaking water tanks, and had no ground connection.

● Know Swarming Dates

Second important aspect of termite biology that helps in control is knowing swarming dates of the various species. Figure 1 summarizes data collected on this part of termite behavior. On the whole, it is dependable for the southern half of Florida. In north and west

SEASONS OF ALATE PRODUCTION BY FLORIDA TERMITES

	Calcaritermes nearcticus	Cryptotermes brevis	Cryptotermes cavifrons	Kalotermes approximatus	K. milleri	K. jouteli	K. schwarzi	K. snyderi	P. simplex	R. flavipes	R. hageni	R. virginicus	Neotermes	
January	O		O			O			O		O*			
February			O*							O	O			
March	O*	O	O*		O	O	O	O*		O*		O*	O	
April	O*	O	O	O	O	O	O			O		O*		
May		O*	O			O*	O*	O*				O		
June		O	O				O*	O					O	
July														
August							O	O			O			
September				O			O	O						
October		Oc	O			O*		O	O		O	O	O	
November				O			O	O	O*		O	O	O	
December			O				O		O*		O			

(Based on collection records from A. E. Emerson, Thomas E. Snyder, E. M. Miller, and T. Roy Young).
O—Months in which maturely pigmented alates have been collected, either flying or in colonies.
*—Probable peak or center of swarming period.
c—One instance known; alates in colony but not swarming.

Figure 1. TOs who know swarming dates of termite species they are called on to control have conquered an important aspect of termite biology. Photographs of this diagram and Figure 2 on page 36 are available from W. B. Clements, Box 65, Leesburg, Fla. for $1.00 each.

* This article deals exclusively with the biology and habits of termite species found in Florida. It should not be used as a general guide for termites throughout the country.

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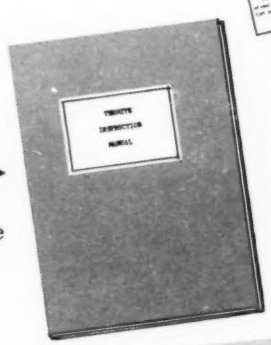

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Florida it would be expected dates might run two weeks to one month later.

Most useful for Florida TOs is the information on **Cryptotermes brevis, Prorhinotermes, R. hageni,** and **R. Virginicus.**

Adults of **C. brevis** and **Prorhinotermes** are nearly indistinguishable to the naked eye, and some confusion has occurred in control methods on this account. However, I know of no instance of **C. brevis** swarming in the winter, while **Prorhinotermes** habitually swarm from October through January.

R. Hageni swarm earlier in the season than **R. virginicus** although there may be some overlapping between these two. **Kalotermes** generally swarm throughout the year, with a tendency towards peak activity in the late spring and early summer. These forms are less frequently important to the TO and less likely to be confused with other species.

● Colony Growth and Activity

Householders, and sometimes TOs, may be concerned about the speed with which they must act when an infestation is discovered. Some think treatment must be immediate, lest the house fall down upon them. Actually, there is usually plenty of time to do a thorough job of analysis and planning. Just before the swarming season greater speed would be useful to forestall the starting of new colonies.

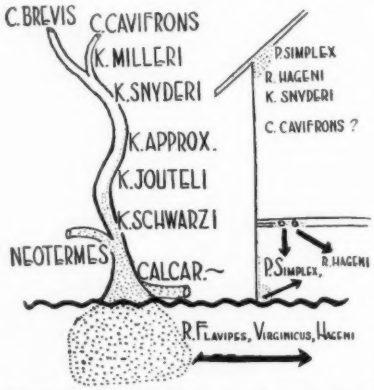

Figure 2. Diagram shows moisture needs of common Florida termite species. Those closest to the moisture source require the most moisture; those furthest away, the least.

In general, colony activity is related to the colony size. An incipient colony amounts to very little for 4 to 5 years. A large colony may build tubes at the rate of 2 or 3 inches a day, and may do noticeable damage in new timbers after 1-2 years. Conditions are extremely variable. Furthermore, the **Reticulitermes,** because of the larger population in a colony, do more damage. **Cryptotermes brevis** works slowly, the populations are small, but each individual seems to consume a great deal of wood. Probably 5 or 6 years from the start of an infestation they will produce considerable damage in a piece of furniture.

Generally, **Kalotermes** colonies are much less populous and grow more slowly than those of **Reticulitermes.** Furthermore, **Kalotermes** colonies tend "to run their course," with swarmers going off each year, and no permanent workers being left behind. After reaching a peak of growth the colony may grow smaller, providing, of course, that no supplementary queens begin to function.

Understanding termite biology and behavior is important. Pass along this information to service-

(Continued on page 48)

Based on a talk before the 1954 National Pest Control Association convention.

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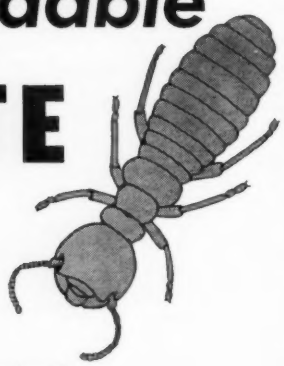

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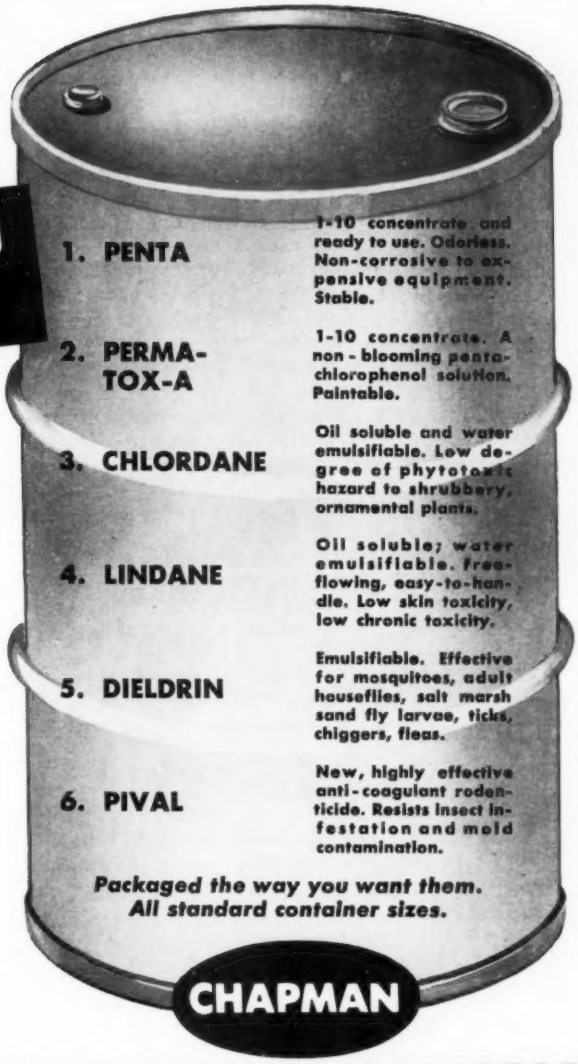
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Damp-Wood Termites "Hitchhike" Ride In Lumber Shipped East From West Coast

By PROFESSOR J. J. DAVIS
Head, Department of Entomology, Purdue University, Lafayette, Indiana

In September of last year the damp-wood termite **(Zootermopsis angusticollis,** Snyder det.) was found in a shipment of lumber consigned to a lumber company in South Bend, Indiana, from Broadbent, Oregon. The lumber was 2x4 x8′ green Douglas fir, anti-stain treated and some fifteen pieces of the carload were infested. Although the damage was not great, Doctor Thomas E. Snyder advises us that this termite possibly could become established and might become a serious problem.

In his book "Order Isoptera — The Termites of the United States and Canada," published as a technical bulletin of the National Pest Control Association (1954), Doctor Snyder relates an interesting complete account of a similar introduction of this species in lumber from Oregon, as follows:

"On October 7, 1951, a dealer in lumber and building supplies received a car load of 2x10 Douglas fir lumber at his yard near Philadelphia, Pa. The lumber was shipped by box car from Portland, Oregon and was cut near Portland. The grade was No. 3 common and 30,317 board feet were involved, costing $75.00 a thousand board feet. This lumber was found to be infested with the damp-wood termite of the Pacific Coast—**(Zootermopsis angusticollis,** Hagen). The dealer protested to the local representative of the Portland lumber company, but was informed the lumber met No. 3 grade and could not be rejected. This grade allows local areas of decay and scattered worm holes, but not a serious combination.

"Large numbers of living nymphs (some with well-developed wing pads) and soldiers in large chambers were found in the lumber. Every board which was examined contained live termites or showed termite galleries or pellets from the exterior. The infestation was several years old and probably these termites attacked dead standing trees or logs from which the lumber was cut.

"This lumber was condemned by State officials and burned. This damp-wood termite could be very injurious if it became established in Pennsylvania.

"All refuse or wood debris, etc. under the piles where this infested lumber was stored was burned. Also, the soil under these piles was poisoned in case termites, which dropped from pockets in the wood to the earth when the lumber was piled or cut into during examinations, were alive. This termite does burrow into the earth to some extent, unlike the usual habit of the nonsubterranean termites."

Paul T. Ulman **(in litt.)** Assistant State Entomologist of Indiana, reports two previous interceptions of the damp-wood termite in Indiana. One was at Indianapolis in 1953 in a car load of second or third grade lumber. The other was at Gary in 1954.

(Continued on page 57)

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TOX-EOL "WO" Add Oil or Water — TOX-EOL "WA" Water Only

MAKE LOW COST EFFECTIVE SOLUTIONS

QUICK KILL! LASTING REPELLENCY!
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Allied SANITATION *Services and Products*

A section of PEST CONTROL devoted to new ideas and methods for broadening the scope of PCO operations to boost profits by increasing their range of sanitation services

Sales of Related Sanitation Products Increasing Income for Many PCOs

One out of three pest control firms sells some type of sanitation product retail. That's the consensus of interviewers who have combed the country over the last several years. Some say the percentage is more like 40 or 50%.

Reasons given by operators for the addition of allied sanitary chemicals and products all add up to one purpose: to make more money.

Some say over-the-counter sales provide enough income to cover rental on their store. Others report their salesmen can make extra commissions for themselves and profits for their employers by selling sanitary supplies to the same customers that buy their regular pest control service.

"Whatever the arguments PCOs give," one operator told us, "the trend in our industry is towards greater sanitation. Many times the cause of insect and rodent infestation is insanitary conditions which can best be cleared up by using products that will help them clean the place. Such customers often ask me for advice on the type of product to use. If I can supply it, I'm not only increasing my service to them, but bringing in extra business I would otherwise have to turn over to someone else."

Sanitary suppliers, too, have reported an increasing demand for their products from pest control operators. No doubt about it, PCOs are ringing up extra business with sanitation products.

Age of Aerosols With Us

Aerosol dispensing has spread to include virtually every liquid pest control formulation the PCO uses except rodenticides and termite chemicals.

Few suppliers represent their aerosol product takes the place of regular pest control service, but pressurized insecticides are useful for stop-gap elimination between PCO visits, especially for adult insects such as resistant flies and mosquitoes.

Varying size containers are available at wholesale rates which give PCO-retailers an attractive profit margin. New post office regulations permit mailing of most aerosols provided they are packaged properly.

Professionally compounded aerosol insecticides are one of the most popular sanitary products sold by PCOs today.

Soap Dispensers, Too?

Rest room and locker sanitation is often the key to successful insect control in restaurants, food packing plants, factories, etc. Clean hands are important to halt the spread of disease. Liquid soap dispensers are a neat, economical way for management to help keep such areas dirt-free.

If the line of sanitary products PCOs handle includes soap dispensers they'll not only make a profit on sale of the unit, but also on the supply of liquid soap.

Profits In Odor Conditioners

One of the problems PCOs run into frequently is that of odor either from the pesticide formulation they're using, from a decaying rodent carcass, or from causes for which they are not responsible.

Odor conditioners, which scent or purify the air, are frequently an answer to such problems. While such deodorizers are not a pest control device in any sense of the term, they do supplement an all around sanitation service.

The manufacturers and distributors of such odor counteractants have special distributor set-ups for PCOs which are attractive. After an initial installation, or sale, repeat business is assured through servicing with replacement of the deodorizing material. Servicing on regular pest control service calls takes but a moment and you've made another sale.

Editorial

Throughout its 22 year history, **Pest Control** has kept pace with what its readers are doing by supplying them with information that will help them do a better, more profitable job.

This new section is in keeping with recent developments in the pest control industry. Firms are broadening their offerings to include custom spraying, weed control, ornamental pest control, the sale of allied sanitation products and services, etc.

This is your section. If you seek information let us know, or if you have new money-making ideas to share, send them in. We have been planning this section for over a year. Hope you like it.

Market For Vaporizers

Controversial as they are, insecticide vaporizers have a place in pest control. Rightfully, the American Medical Association warns against their use in homes or where people congregate.

Dead storage warehouses of stored products other than food, are an ideal place for vaporizers. Properly set, they can build up in still air a lethal atmosphere in which adult insects cannot survive. Warehouses for furniture, fabrics, machinery, building materials, records, etc. are all suitable for vaporizer installation.

Small Equipment Money Maker

For the customer that wants to have some of your private brand formulation pesticide handy, or the prospect who thinks he might do the job cheaper himself, you should stock small consumer-size application equipment. There's always a ready sale for small sprayers, bulb dusters, insecticidal smoke cans, glue boards and, yes, even fly paper.

Profits Unlimited!

Solve Your Indoor Fly Problem!
DISPOSABLE AEROSOL INSECTICIDE
Professional 3-Lb. Aerosol
Non-Irritating!
Industrial Strength Formulation
D.A.I. is safe to use in restaurants, hospitals, food plants, super markets and other food-selling establishments—wherever flying insect control without hazard to humans is essential.
3/4-lb. Regular Size D. A. I. BOMB
Handy, disposable, economical! Knock-down strength of several gallons of ordinary spray.
Packed 6 per Carton.
Each $2.40
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DISPOSABLE AEROSOL INSECTICIDE
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ECONOMICAL TO USE
Each bomb treats over 600,000 cu. ft., or 10,000 cu. ft. over 60 times.
NO DEPOSITS—NO RETURNS
List Price $8.70 per 3-Lb. Bomb. Each unit is sold complete with no extra valves or nozzles to buy, pictured as it will be shipped.
Easy D.A.I. Way
One-hand, one-finger operation! As easy to treat ceiling corners as waist-high areas. When bomb is empty, just throw it away!
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Always ready and easy to use.
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This advertisement will attract attention from coast to coast among *your* customers, and urge them to buy D.A.I. from you. It will be published in national trade publications with several hundred thousand readers monthly among food stores and super-markets, hotels and motels, restaurants and food processors, hospitals and other establishments where fly control and other insect problems offer you unlimited sales and service opportunities. Be prepared to sell and serve your customers with the most effective and safe fly and insect control yet developed—D.A.I.

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Each $2.40 *Carton $12.50*

Dioptron "No Stinky" garbage can deodorizers reportedly effective three to four months.

New Garbage Can Deodorizer

Dioptron Company, Milwaukee, has come out with a deodorizer which reportedly kills odors in garbage cans for three to four months without any servicing. The new deodorant, "No Stinky," is also said to repel rats, dogs, flies, and kill maggots.

Long life of "No Stinky" is due to the following says Dioptron: it comes in a full four ounce metal container; louvers "meter out" chemicals as needed, thereby not exposing the bare cake of chemicals to the air; a heat stabilizing ingredient opposes melting at even 125 degrees so there is no danger of loss due to heat; and the exhaustion of paradichlorobenzene, one of the insecticidal chemical ingredients, does not mean the end of the deodorizer, because other especially formulated potent aromatics repel flies and deodorize independently.

Spraying Systems Pamphlet

Information on the complete line of Spraying Systems Co. sprayers for pest control has been compiled into a handy, four-page bulletin. Included in the publication are illustrations, general product descriptions, and capacity data.

For copies of the bulletin write to firm headquarters in Bellwood, Ill.

Emulsol Herbicide Manual

A technical bulletin entitled "Formulators Manual of Herbicide Formulations" has been issued by Emulsol Chemical Corp., Chicago, Ill. The pamphlet covers emulsifier recommendations for high and low volatile 2,4-D and 2,4,5-T esters as well as the carbamates herbicides. It is available free from Emulsol.

Sprayer, Duster Outlook Bright

Sprayer and duster sales outlook for 1955 is more favorable than ever, reports Thomas M. Burton, of D. B. Smith and Company, Utica, N. Y., in a recent release of the National Sprayer and Duster Assn. According to Mr. Burton, three reasons for the expected increase in sales are: (1) more and more farmers, gardeners and other growers are accepting spraying and dusting as a normal gardening or farming routine; (2) a national population increase is resulting in a steady market growth of foodstuffs; and (3) gardening and landscaping on a part-time scale is becoming a national pastime.

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Each product designed for easy, economical, and effective use — attractively packaged to bring fast over-the-counter sales.

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UNI-VAP IS DESIGNED AND GUARANTEED TO PROVIDE:

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★ **Long Life** with Chromalox Heating Element.
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The ORB Industrial Aerosol Bomb for Fly Control *has these advantages*

1. **100% PYRENONE* FORMULA**
   Completely safe—Highly effective
2. **CONCENTRATED FOR ECONOMY**
   Contains 4.0% piperonyl butoxide plus 0.5% pyrethrins
3. **CONTROLLED PARTICLE SIZE**
   Extremely small aerosol particles
4. **REGULATED OUTPUT**
   Sprays longer—lasts longer
5. **LOW OIL CONTENT**
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NOW THE NEW

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is available

Write for details about our new 3-pound disposable aerosol bomb. Same high potency 100% **PYRENONE*** formulation. Can't be beat.

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Has No Insecticide Or Solvent Odor Whatsoever

It's a ready-to-use lindane formulation in oil that will fill all your needs as a general all 'round residual.

It's effective on all the common crawling insects infesting structures — ants, roaches, silverfish, fleas, etc.

Use it on those jobs where no odor can be tolerated or use it to sell a truly "odorless job."

Available in 55 gallon drums and 5 gallon cans.

Priced low so you can afford to use it!

TINOLAN OB MOTHPROOFING CONCENTRATE

If you formulate insecticides for resale or even for your own use, here's an effective mothproofer, proved in use since 1924. Tinolan OB Concentrate is an oil soluble concentrate which is diluted with insecticide base oil to make the finished mothproofer. It leaves no residual odor or stickiness on treated fabrics and does not stain. Detailed entomological and toxicity information is available. Packed in 1 and 5 gallon cans and in 55 gallon drums. This is a real profitmaker.

Write Today for Details on All of these Orb Products

ORB INDUSTRIES

1016 E. Montgomery Ave. Philadelphia 25, Pa.

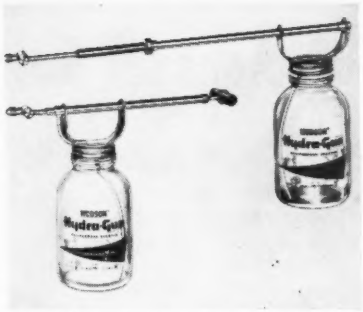
Hudson "Hydra-Gun" Sprayers

Two sprayers known as Hydra-Guns, said to be ideal for spraying flowers, gardens, shrubs, medium-size trees, lawns, grain, and for general pest control work, are now being manufactured by the H. D. Hudson Manufacturing Co., Chicago. They are especially suitable for over-the-counter sale by PCOs.

According to the company, the Hydra-Gun, Jr. sprayer has a single action pump with a spraying range of about 20 feet. Hydra-Gun Sr. sprayer has a slide-type pump that sprays on both the in and out stroke and has a spraying range of 30 feet.

The new Hydra-Guns reportedly feature a high-pressure brass pump with a new type nozzle that adjusts instantly to any spray from fine fog to long distance and also to any spraying angle. They are said to handle all sprayable solutions, and the half-gallon jar container is interchangeable with standard fruit jars.

Jar labels are permanently enamelled, include selling points, and use and care information. A special printed base for counter or window display is packed with each carton of two Hydra-Guns, Hudson claims.



Hudson Hydra-Gun sprayers good retail item.

Dieldrin for Lawn Insects

Lawn insect control with dieldrin is the subject of a new, 12-page booklet being distributed by the Shell Chemical Corp., New York City. Colorfully illustrated with drawings of 11 soil, surface and foliage insects, the bulletin covers their control as well as application of dieldrin for control of household insects.

Copies may be obtained by writing to Shell and asking for "How to Kill Insects With Dieldrin."

Chipman Weed, Grass Killer

A non-selective weed and grass killer for industrial, agricultural and railroad use has been announced by Chipman Chemical Co., Bound Brook, N. J.

Called "Chlorea," this new product is said to kill all types of vegetation efficiently and economically. It is reportedly a uniform non-separating combination of sodium chlorate, borate and CMU, which combines the proved effectiveness of chlorate on deep-rooted weeds with the prolonged soil-surface action of CMU on shallow-rooted grasses and annual seedling growth.

According to Chipman, Chlorea is non-poisonous, and because of its borate content, does not create a fire hazard when used as directed. It can either be applied dry or as a water-mixed spray.

Moth Damage Tips

A 5% DDT oil solution sprayed to woolens protects them from moth damage, reports Virginia Davis, extension clothing specialist at the University of Massachusetts.

BUILT FOR THE PEST CONTROL SERVICEMAN THE...

IDICO STAR

LIGHT COMPACT PORTABLE WELL BALANCED

Completely Re-designed with...

More Power . . . at your Fingertips
More Comfort in the Hand
Improved with Swivel Directional Extension
Interchangeable Fine Fog Nozzle, Penetrating Pin Stream Nozzle.

PISTOL HAND GRIP . . . Trigger Operates High Pressure Hydraulic Piston . . . With Ease — No Heavy Pumping, Dripping or Spilling. Equipped with 1 quart brass bottom container. Outlasts all other type cans. Has large opening for easy and convenient filling.

IDICO STAR Retails for $10.75

Warranted To Give Long Uninterrupted Service and Use.

SPECIAL INTRODUCTORY OFFER and PRICE TO P.C.O.'s.
10 DAYS TRIAL With MONEY BACK GUARANTEE . . . ONLY $8.60.
In Dozen Lots 10% Less. Check Must Accompany Order.

IDICO PRODUCTS CO. 1-3 West 125th Street New York 2 N. Y.

Senco

SENCO PIVAL CONCENTRATE

An anticoagulant rodenticide. Mix one pound of Senco Pival Concentrate with 19 pounds of corn meal to prepare baits for rats and mice.

5 lbs. $8.75 25 lbs. $41.25
100 lbs. $155.00

Freight prepaid on 50 pounds or more.
2% discount if check is sent with order.

SENCO PHOSPHORUS PASTE

A specific application for the larger species of roaches — American and Oriental roaches.

25 lbs. ..... 11.00 100 lbs. 35.00
10 lbs. ..... $ 6.00 50 lbs. $19.00

Shipped freight prepaid in the U. S. A.
2% discount if check is sent with order.

SS 56% TC CHLORDANE CONCENTRATE

Special Senco 56% Termite Control Chlordane Concentrate

One gallon makes 32 gallons of a 2% Chlordane emulsion. A 2% emulsion made with this concentrate costs you about 15c a gallon.

5 Gal. Pails at $5.10 per gal. ..... $ 25.50
30 Gal. Drums at $4.95 per gal. 148.50
55 Gal. Drums at $4.85 per gal. 266.75

Freight Prepaid on 15 Gallons or More.
2% Discount if check is sent with order.
Write for our complete price list.

SENNEWALD DRUG CO., Inc.
2721 Chouteau Ave. St. Louis 3, Mo.

Bad news for insects; good news for you

LETHALAIRE® CONTROL, ECONOMY AND EFFICIENCY NOW AVAILABLE IN NEW 2½-POUND THROW-AWAY PACKAGE

Since its introduction, the 5-pound Lethalaire bomb has become standard control for large industrial users as well as professional operators. Now most of the advantages of the larger bomb—plus a disposable container—are available in a brand-new 2½-pound high-pressure aerosol package called Lethalaire Jr.

Lethalaire Jr. enables you to sell even small users who want a high-quality insecticide.

The secret of Lethalaire Jr. quality lies in its specially designed applicator valve. Unlike ordinary valves, which merely squirt out aerosol in uncontrolled quantities, this valve correctly meters the flow at a rate of 1½ ounces per minute and controls particle size for maximum killing effectiveness.

One Lethalaire Jr. package will operate continuously for 26½ minutes and treat 532,000 cubic feet of space. This valve is hand-wheel operated and is easily transferred from an empty to a filled container.

Two formulas—which will kill resistant flies, mosquitoes, wasps, gnats, moths—are now available. One contains pyrethrins-piperonyl butoxide; the other, pyrethrins sulfoxide. New ones will be issued from time to time.

If you're now handling Lethalaire, you know how effective, how profitable it has been and will welcome this opportunity to extend your market. If not, you will want to get in on this deal with a brand-new package. For full details, write **LETHALAIRE DIVISION, VIRGINIA SMELTING CO., Dept. PC, West Norfolk, Va.**

VIRGINIA Chemicals

Available in Canada and many other countries

New Vogel-Ritt Sanitation Division Headed by Jacobson

Fred B. Jacobson has been appointed director of Industrial Sanitation Consultants, a new division of Vogel-Ritt, Inc., Philadelphia. The new division will offer its service to industries throughout the country to make surveys and map out a sanitation program for insect, rodent and pest control, and for plant sanitation and equipment. Client companies will then either call on pest control organizations to carry out the program, or establish their own plant sanitation organization.

Vogel-Ritt's new division, said to be one of the first of its kind, will cover such industries as food, canning, preserving, bottling, brewing, candy manufacturing, and baking as well as retail stores, hotels, and many other fields.

Mr. Jacobson was director of sanitation at Stephen F. Whitman & Son, Inc., Philadelphia, for seven years and also a consultant and lecturer for many organizations in the food, beverage and canning industries in that area. He is secretary of the American

Fred B. Jacobson, formerly sanitation director for Whitman's chocolates.

Entomological Society, and a member of the Entomological Society of America and the Industrial Sanitation Management Association.

500 Attend Custom Spray Meet

Over 500 custom spray operators attended a recent meeting on the University of Illinois campus to study new developments in the battle against insects and weeds. The two-day conference was staged by University insect and weed specialists and Illinois Natural History Survey entomologists.

Agronomist Fred Slife reported that after three years' research the best weed chemical for soybeans is 2,4-D amine applied at the rate of one-eighth pound per acre when the soybeans are 3-5 inches tall. This rate is heavy enough to kill many weeds and stunt others while causing no damage to soybeans at that growth stage, he said.

Good results in pre-emergence spraying of corn for both grassy and broad leaf weeds has been obtained from a new family of herbicides called alpha-chloracetimides. L. H. Hannah of the Monsanto Chemical Co., St. Louis, reported. He said they were effective on heavy clay soils as well as soils high in organic matter, and for a wide range of horticultural crops.

In another conference session, J. H. Bigger, of the Illinois Natural History Survey, told delegates lindane, endrin, dieldrin, heptachlor, and aldrin have given excellent control of root-feeding insects in extensive field tests.

TIME TESTED & PROVED...

Scent-Flo

Makes air Fresh as a Daisy

BEST FOR YOUR CUSTOMERS MOST PROFITABLE FOR YOU...

The SCENT-FLO ELECTRIC FAN-OPERATED AIR FRESHENER IS THE SALES LEADER IN THE FIELD TODAY—THE FIRST AND STILL THE FINEST DEODORIZER ON THE MARKET! Sanitary operators report bigger profits and more repeat sales based on greater customer acceptance and the MONEY BACK GUARANTEE of the manufacturer — the originator of the electric fan-operated deodorizer. WRITE TODAY for full details on FREE trial offer for yourself or one of your customers.

GLYCO-AIRE-WAFER REFILLS are absolutely longest lasting, most effective, LOWEST priced, fit ANY make electric deodorizer—assure satisfied customers and steady monthly sales and service. Free samples on request.

Scent-Flo DISTRIBUTING COMPANY
7227 HAMILTON AVENUE, PITTSBURGH 8, PA.

You Can **MAKE MORE MONEY**

by using and selling

FUMO-KILL

The New, Safe Fumigant that will kill

Spiders, Moths, Mosquitoes, Silverfish, Wasps, Waterbugs, Bedbugs, Roaches, Etc.

FUMO-KILL is truly the modern method of insect extermination. Light match to contents in can will produce fumes—NO FLAME. Non-hazardous. This amazing **FUMO-KIL** insecticide has been tested, and is registered with the U. S. Department of Agriculture.

FUMO-KILL has the following advantages:

EASY TO USE: Fine Vapors destroy pests and their nests.

ECONOMICAL TO USE: Two-ounces Fumigates up to 6,000 cubic feet.

EFFECTIVE TO USE — Vapors Penetrate Entire Room—Every Crack and Crevice

Special Offer!

Order 1 dozen 4 ounce cans at $13.50 per dozen, and get one 4 ounce can FREE

FUMO-KILL can be obtained in 2 oz. (enough for up to 6,000 cubic feet)—4 oz. and 1-lb cans.
Cost of 12—2-oz. Cans . . $7.50 per doz.
Cost of 12—4-oz. Cans . . $13.50 per doz.
Bulk . . . . . $4.50 per lb.

Delivery Charges Prepaid
For complete information write or phone today.

MAR-MEL PRODUCTS, INC.

Phone: Van Buren 6-2060-61

753 South Kedzie Ave. Chicago 12, Illinois

For Professional Results

Get All 3!

1. No Drip
2. Uniform Discharge Pressure
3. Uniform Droplet Size

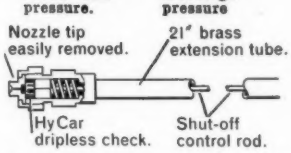
USE

HUDSON X-Pert* SPRAYERS

with MiniMax* Spraying System

Pump valve limits tank pressure.

Valve regulates discharge pressure



No dripping — HyCar check shuts off spray at nozzle tip.

Minimax Spraying System is the ultimate in precision spraying. It consists of: 1. A valve that signals when tank pressure is 55 lbs. 2. A valve that holds nozzle pressure at a constant 25 lbs. for uniform spray pattern, correct droplet size. 3. Drip-Not* valve that shuts off positively at nozzle, allowing no drip whatsoever.

Other outstanding X-®Pert features: Simplex Inner-Seal* closing — "the higher the pressure, the tighter the seal" . . . Tubular strainer at control valve . . . Large tubular handle (also stores nozzle tips) . . . Footrest . . . Nu-Action* pump . . . Welded tank . . . 5' of Kem-Oil* hose. 3 or 4 gallons, stainless or galvanized steel tank.

Other Hudson Sprayers for Professional Use

Saf-T-Lok* X-Pert 2 gallons

Electric Sprayers

Eclipse*—All Stainless Steel

Capital® 3-Qt. Compression Sprayer

SIGN OF THE BEST BUY

HUDSON®

For Complete Information Write

H. D. HUDSON MANUFACTURING COMPANY
589 East Illinois Street
Chicago 11, Illinois

*Trade Mark

MR. PCO...THIS IS IT

THE TIME OF THE YEAR WHEN

★ Everyone is Moth and Carpet Beetle Conscious;
★ Valuable Rugs and Carpets are being protected from Moth and Carpet Beetle damage;
★ Large Profits are being made by aggressive **PCO's** who are mothproofing and giving **PER-MO's 5-YEAR** Written Guarantee.

PER-MO MOTHPROOFING INCREASES YOUR PROFITS!

Most PER-MO dealers easily show **500% PROFIT** on Mothproof Service Work . . . In addition, we help you sell Mothproofing by giving you **FREE** envelope stuffers and other dealer aids.

We give your customers a **WRITTEN GUARANTEE** that their rugs and carpets won't be damaged by moth or carpet beetle larvae for at least **5 YEARS** . . . In case of damage, **PER-MO** assumes **100% OF LIABILITY**. . . Water-base type of liquid, **EASY-TO-USE,** harmless, **WILL NOT SPOT OR STAIN** . . . Odorless, and causes **NO INCONVENIENCE** while Mothproofing in a home . .

DON'T WAIT UNTIL THE MOTHPROOF SEASON IS OVER. CONTACT US TODAY FOR FULL DETAILS!

PER-MO RAT POISONS

RAT and MICE LIQUID — Contains Arsenic — One of the deadliest of all rodent poisons. Can be used as a rodent poison two effective ways: either as a drink or mixed wtih food bait.

RAT PASTE — Contains fortified Red Squill — One of the safest of the raticides. Specially prepared to use around homes, food warehouses, etc., Red Squill is recommended by the U.S. Dept. of Agriculture for Rats.

RAT BITS — A ready-to-use bait containing Red Squill. **BROWN RAT KILLER** — A easy-to-use paste with ANTU. For spreading on bread, crackers or cardboard.

Other Products Include FLAMEPROOF LIQUID — "CHEK" DEODORANT. Generous Sample of All Products Sent Prepaid — Only $5!

CELEBRATING OUR 20th YEAR

PER-MO PRODUCTS CO.
Dept. P54, 1715 E. 36 St.
KANSAS CITY, MO.

PER-MO
STANDS THE TEST
IT'S BY FAR THE BEST

→MAIL THIS COUPON TODAY!←

PER-MO PRODUCTS COMPANY Dept. P54
1715 E. 36 St., Kansas City, Mo.

☐ FREE literature and price list on all PER-MO Products!
☐ Generous sample carton of all PER-MO Products, postage prepaid! I enclose $5.00 (check or money order).

I am especially interested in PER-MO _____

Name _____

Company _____

Address _____

City _____ **State** _____

Just sprinkle it around

the kiss of death!

HY-TOX FLY BAIT IS SURE DEATH TO FLIES

A granular bait that may be easily sprinkled in areas inhabited by flies and fly larvae. One application lasts several days and kills even "resistant" strains.

attracts and kills flies.
EASILY—QUICKLY
1 lb. can also 5 lb. & 25 lb. sizes.

MILLER

MILLER CHEMICAL & FERTILIZER CORP.
2226 N. Howard St., Baltimore 18, Md.

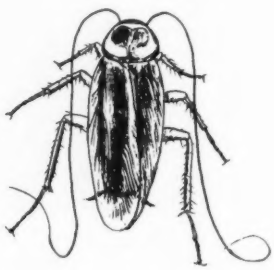
Pest Control PRIMER

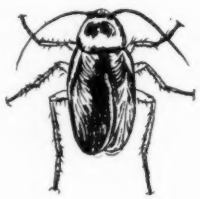
LOOK ALIKES: 4

Prepared by DR. MARION E. SMITH and HSIU-FU CHAO
Entomology Department, University of Massachusetts, Amherst

American Roach and Australian Roach

Physical differences between the American roach and Australian roach are taken up in this fourth in a series of illustrated columns that tell how to correctly identify insects that are often mistaken for other pests. Good use can be made of this material both for your own self-improvement and servicemen training programs. In March, the authors explained the identification techniques to distinguish between Pharaoh's ant and thief ant.





AMERICAN ROACH Periplaneta americana		**AUSTRALIAN ROACH** Periplaneta australasiae
Uniform reddish brown	**Wings**	Reddish brown, with **bright yellow streak** on outer edge near thorax.
Longer than wings.	**Antennae**	Shorter than wings.
With wings, 1½ - 2 inches.	**Size**	With wings, about 1¼ inches.
Thorax and abdomen unspotted, uniform color.	**Nymphs**	Thorax and abdomen with bright yellow spots.
Restaurants, bakeries, houses, stores, ships; usually in kitchens and basements.	**Habitat**	Greenhouses, sometimes entering houses.

Biology of Fla. Termites

(from page 36)

men, to create a corps of operators who work with understanding and intelligence, and who are able to explain termite facts to householders. This is good medicine for the termite profession to use in holding the line against irresponsible operators who try to encroach upon various communities, and for use in gaining the confidence of prospective clients.

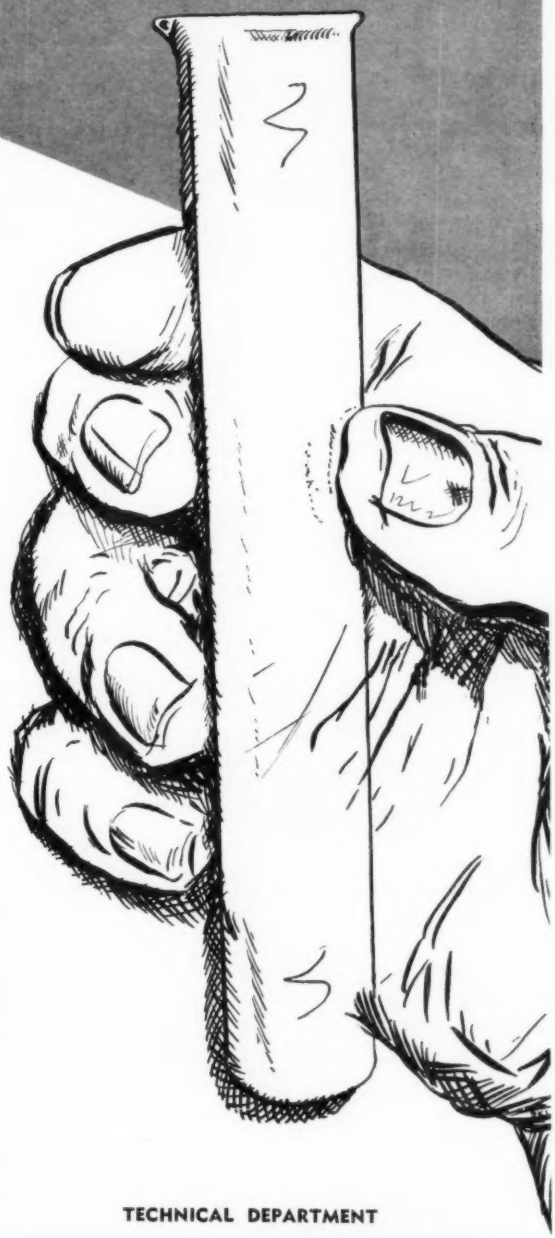
Shell Opens Ohio Office

Agricultural Chemicals Division of Shell Chemical Corporation has opened a news sales office in Columbus, Ohio, announces Frederick W. Hatch, division manager. According to the company, increased business in the central part of the United States has made this expansion program necessary.

The new office will be under the direction of S. J. Hastings, district manager in New York. It will be headed by J. H. Hawke with C. J. Green as technical salesman, and will serve as headquarters for representatives in Ohio, Kentucky, Michigan and West Virginia.

NEW

THESE ARE THE PRODUCTS... 9 OUT OF 10 PCO's ARE LOOKING FOR!



RESIDEX 70AG

Residex 70AG is an 8 lb. agricultural grade solubilized chlordane concentrate. It is diluted at the rate of 1:50 to form 2% chlordane emulsions that are used for soil applications. Residex 70AG provides extremely economical treatment for the control of soil infesting insects, particularly termites. Costs less than 16c per gallon of ready-to-use material. 1 gal. of concentrate makes 50 gallons of ready-to-use material.

1 Gal Can	$7.90 Gal.
5 Gal. Can	7.50 Gal.
30 Gal Drum	7.30 Gal.
55 Gal Drum	7.20 Gal.

FLY FLAKES

The original commercial dry fly bait. Packed in shaker-type 1-pound cans and in bags in the larger sizes.

Fly flakes provide a simple and very effective method of fly control. This DRY BAIT contains malathion for the control of flies in urban, agricultural and dairy areas.

1 Lb. Can - 12 Case	$7.64 Case
5 Lb. Bag - 8 Case	9.55 Case
10 Lb. Bag - 4 Case	8.67 Case
25 Lb. Drum	5.17 Each

DIAZINON DRY BAIT

A ready-to-use DRY BAIT containing 1% Diazinon to be used in hog and calf barns, sheds, and poultry houses for the control of resistant flies.

1 Lb. Canister - 12 Case
$12.00 Case

DIAZINON 25% WETTABLE POWDER

Proven longest lasting method of Residual Control of resistant flies. A 25% Diazinon wettable powder to be diluted with water and applied as premise spray in agricultural locations for the resdiual control of resistant strains of flies.

4 Lb. Bag - 12 Case
$96.00 Case

WATER SOLUBLE WARFARIN

A concentrate containing 0.5% warfarin to be diluted with water. Packed in bulk for P.C.O. use.

5 Lb. Can	$2.65. Lb.
10 Lb. Canister	2.55 Lb.
25 Lb. Canister	2.35 Lb.
50 Lb. Canister	1.95 Lb.
100 Lb. Canister	1.85 Lb.
500 Lb. Canister	1.80 Lb.
1000 Lb. Canister	1.75 Lb.

RESIDEX PIVAL RODENTICIDE

A ready-to-use, expertly blended rodent bait with .025% Pival as an active ingredient. Residex ready-to-use Pival Rodenticide is available in two forms: Rough grind—for the control of rats and Corn Meal - for the control of mice.

10 Lb. Carton	$ .32 Lb.
25 Lb. Carton	.29 Lb.
50 Lb. Carton	.29 Lb.
100 Lb. Drum	.25 Lb.
200 Lb. Drum	.24 Lb.

RESIDEX ODORLESS MOTHPROOFER

A COMPLETELY odorless D D T mothproofer that can be used in homes, hotels, theatres and woolen and fabric mills. Can be used by professional pest control operators or sold for use by the home owner.

½ Gal. Cans - 8 Case	$ 8.08 Case
1 Gal. Cans - 8 Case	13.52 Case
5 Gal. Cans - 8Case	1.25 Gal.
30 Gal. Drum	1.10 Gal.
55 Gal. Drum	1.00 Gal.

Residex also has available to the P.C.O. a complete line of fungicides grass killers, fogging and aerosol, soil fumigants, wood preservatives, weed and brush killers, grain and spot fumigants, and hand and power spray equipment.

When ordering . . . ask for the new Residex catalog.

TECHNICAL DEPARTMENT

RESIDEX CORPORATION

1500 West Elizabeth Avenue
WABASH 5-1320 LINDEN, NEW JERSEY

PEST CONTROL

notebook

Bull Horns In The Junk Shop

By Joseph R. Gross

Looked into the window of a "swap shop" a little while back and saw a beautiful pair of bull horns mounted on red velvet. My little girl had been hounding me to get her some horns to decorate her room, so I went in. The storekeeper even let me climb in the window myself to retrieve them.

They sure looked different close up. What once had been a beautiful ebony-black set of fighting horns, now was just a shell, paper thin in places and punctured with holes in a way that reminded me of nothing so much as a piece of floor board thoroughly done-in by termites.

What did it? There were plenty of termite wings everywhere but I was sure it wasn't termite damage. Inside the horns was an abundance of other evidence. I poured out a fistful of dirty, cream-colored fecal pellets. Superficially they did resemble the pellets of dry-wood termites but were way too small. Nor did they show the characteristic shape of dry-wood pellets under the hand lens. Rolled between the fingers they felt like clothes-moth pellets but weren't.

Along with the pellets I found a good supply of cast-off larval skin about 3/16 of an inch long, and characteristically covered with long dark hairs.

The storekeeper showed a keen interest in my researches. In fact, he donated the mount and let me rummage through the whole store. I found a lot of other things damaged by the same insect, especially woolen goods, carpets, clothing and such.

Well it wasn't termite damage. What was it?

(answer on page 62)

Tobacco Moth Bulletin

"The Tobacco Moth As A Pest in Farmers' Pack Houses" is the title of a six-page, illustrated bulletin just issued by the USDA. For copies write the Department's Stored-Product Insects Section in Washington, D. C.

patents

RELATING TO PEST CONTROL

By Dr. R. C. Roark
U. S. Department of Agriculture

Copies of all patents can be obtained for 25 cents (no postage) sent to the Patent Office, Washington, D. C. In ordering a copy of a patent the number of the patent, the date, the name of the patentee, and the subject of the invention should be stated.

2,681,252 (June 15, 1954; appl. Jan. 17, 1951). **SPRAY DEVICE.** Wainwright Tuttlel, Milford, Conn. — Bridgeport Brass Company, Bridgeport, Conn.

2,681,878 (June 22, 1954; appl. Sept. 4, 1951). **INSECT REPELLENT COMPOSITIONS.** Toivo A. Kauppi, Midland, Mich.

2,681,879 (June 22, 1954; appl. Aug. 11, 1950). **CARBAMIC ACID ESTERS AS WELL AS PEST COMBATTING AGENTS AND A METHOD OF MAKING THE SAME.** Hans Gysin, Alfred Margot, and Charles Simon, Basel, Switzerland—J. R. Geigy A. G., Basel, Switzerland —The patentees claim as a new chemical compound, 2,6-dimethylpyridyl-(4)-dimethyl carbamate.

2,682,851 (July 6, 1954; appl. Sept. 18, 1948). **RAT GUARD FOR SHIPS.** Walter M. Mullins, Costa Mesa, Cal.

WILL LONGER FLOAT IMPROVE YOUR INSECTICIDES?

PENN-DRAKE® INSECTI-SOL

This non-toxic solvent will provide the long floating characteristics which assure greater kill for insecticides. It is completely volatile, leaves no residue and has a clean, pleasing odor.

penn drake products

PENNSYLVANIA REFINING COMPANY
BUTLER, PENNSYLVANIA
Branches: Cleveland, Ohio and Edgewater, N. J.
Representatives in all Principal Cities

a NEW* Ready-to-Use Tastier Rat and Mouse Bait

Comes to You Fresh!

NAPESCO'S

EAT-KIL

(PIVAL in a highly acceptable grain base)

Rodent Bait with a Knockout Punch!

*Bait based upon research studies at Purdue University and especially developed for the pest control industry.

½ lb. pkg. $ .50 (48 per carton)
1 lb. pkg. .90 (24 per carton)
3 lb. pkg. 2.00 (8 per carton)
Freight paid on orders over 150 pounds.

25 lb. pkg. $ .46 lb.
50 lb. pkg. .44 lb.
100 lb. pkg. .42 lb.
Write for quantity prices

Also Inquire About NAPESCO BAIT STATIONS

NAPESCO, INC.

East of the Mississippi Order from
Ernest Andersen
NAPESCO, INC.
Route 1, Dresser Road
Lafayette, Indiana

West of the Mississippi Order from
Harlan R. Shuyler
NAPESCO, INC.
3138 State Avenue
Kansas City 2, Kansas

NEW for '55!

Improved Features Make This The Finest Sprayer Your Money Can Buy!

NOW HEAR THIS! One gallon liquid capacity — twice that of competitive sprayers. Regulator valve dispenses anywhere from 1 quart to 5 gallons per hour — *aerosol* or *wet spray*. Beautifully machined — full year guarantee — automatic timeclock — or toggle switch — 110 volt AC-DC current — stainless steel and chrome with baked finish. Rugged — dispenses both oil and water base products! Has tremendous capacity for fogging large areas, feeds direct from 55, 30 or 15 gallon drums. It's the *newest* — the *most* for the money!

IT'S SUPER-POWERED!

NEW 1955

Challenger

AEROSOL SPRAYER

MAIL COUPON TODAY!

JAMES Varley & SONS, INC.

JAMES VARLEY & SONS, Inc.
1200 Switzer Ave., St. Louis 15, Mo.

Gentlemen:
Please rush information on
☐ Challenger Sprayer ☐ Insecticides
Include prices, quantity discounts, etc.

Name.....
Address.....
City.....State.....
Purchasing Agent.....

INSECTICIDES

are for the pests . . .

DON'T LET THEM GET YOU!

For Protection You Can Depend On

SPECIFY

ACME Full-Vision Gas Masks

You know the bug by the damage he does, BUT . . . do you know the dangers to you from the chemicals you use?
For your protection, Acme offers the most practical gas mask equipment with special canisters designed to guard against your specific hazards. Acme's larger lenses give you 2-way vision. You can see what you are doing and others can see and recognize you.

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PEST CONTROL

news

Nathan N. Sameth pioneer PCO helped found first pest control operators' association.

Nathan N. Sameth Dies; Industry Leader 71 Years

Nathan N. Sameth, pioneer PCO who had worked in the industry for 71 years, died late in February of a coronary thrombosis in a Miami Beach hospital at the age of 90.

Mr. Sameth, president of the Sameth Exterminating Co., New York City, was still participating actively in the direction of his company started a half century ago.

Starting at the age of 18, he was an assistant rat catcher on the east side of New York. After several years of apprenticeship he became a full-fledged "rat catcher" and devoted a number of years on his own as a traveling "Pied Piper" working throughout the Mid-Atlantic states, Ohio, and as far west as Chicago.

The Sameth Sanitary Co. was established in Richmond, Va., in 1894. There he manufactured and distributed a rat exterminating product known as "Touch Die." Mr. Sameth also had a branch in New York City and after selling the Richmond business in 1905, moved to New York to devote all his energies to the company which was renamed Sameth Exterminating Co.

Mr. Sameth's two sons, Irving and Eugene, joined him shortly after World War I in the management of the business.

One of the organizers in 1911 of the industry's first trade organization, the New York Vermin Exterminators Association, Mr. Sameth was also active in the NPCA and the NY Pest Control Association.

Surviving are four daughters, and a brother, Maurice. His wife and two sons died earlier. Mr. Walter Quinn now manages the Sameth firm.

During an interview with **Pest Control** about a year ago, Mr. Sameth told us, "This industry is still in its infancy and looks forward to still greater progress in the future."

Diamond Alkali Buys Black Leaf

A new corporation has been formed to take over the manufacture and marketing of Black Leaf brand agricultural chemicals and pest control products. Major interest in the new firm, to be known as Diamond Black Leaf Company, will be held by Diamond Alkali Company, with Virginia-Carolina Chemical Corp. holding a minority share of stock.

The new firm will continue to manufacture and market the complete Black Leaf line of agricultural and pest control chemicals from Richmond, Va.

Resistance Study Extended

Rockefeller Foundation has peldged $15,000 to the University of California for further investigations into insect resistance to insecticides. The project was started in 1952 on a similar Rockefeller grant.

R. E. "Zeke" Kious, NPCA public relations director from October 1953 until April 1st of this year, has joined the staff of Vogel-Ritt, Inc., Philadelphia. Mr. Kious' background includes work with the U. S. Public Health Service as a training specialist and malaria control supervisor, and three years as principal of the Princeton, Mo., high school.

No All-Purpose Insecticide In Foreseeable Future

A recent INS syndicated story appearing in most of the country's newspapers, reported government scientists were less than three years away from fully developing an insecticide which will protect humans against every known form of disease-carrying insect. Dr. E. S. Knipling, chief of entomology research, U.S. Department of Agriculture, was given as the source of this utopian prediction.

Pest Control, which keeps close contact with all scientific pest control developments, hadn't heard of this "revolutionary" announcement, so we contacted Dr. Knipling direct to obtain a first-hand report with all the details. You can relax. The INS reporter was inaccurate and misleading in his story, probably due to his unfamiliarity with the subject matter.

What Dr. Knipling actually discussed with the reporter was insect repellents which are reported in a paper, "New Mosquito Repellents," by Gilbert, Gouck, and Smith. It was presented at the last Entomological Society of America meeting and will be published in its Journal soon.

Summary of this article reveals there are several promising mosquito repellents extremely useful in protecting humans against attack by several disease-bearing insects. One of the government's objectives in its research program for the Department of Defense has been to develop a repellent or combination of repellents which would protect individual soldiers from all major disease vectors. Progress is being made in that direction, but repellents must pass rigid toxicological tests before they can be recommended for use on human beings. The newer, most promising repellents have not yet been cleared for application to the skin or clothing.

Study Mouse Ectoparasites

A concentrated study of mouse ectoparasites is now being conducted by zoologists at the University of Rhode Island, Kingston. Researchers hope to come up with some answers on the biology and disease-carrying potential of such parasites as ticks, lice, mites, fleas and chiggers.

NEW! Internal Pressure Seal Designed

1 GALLON UNIT

offered for the first time
Exclusive with PCE

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And, if you already own a PCE tank-type sprayer, you'll be glad to know that spare parts are interchangeable with other stainless steel tank-type sprayers in the PCE line.

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1 - 4 lbs.	$13.00/lb.
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NO SUPER FLIES *with* BIG STINKY!

One of the problems of fly control today, as you well know, is that of the growing strain of flies resistant to many of the insecticides which were developed in the past few years.

As an effective aid to fly control, we believe that one of Big Stinky's best features is that flies *cannot* become resistant to it.

BIG STINKY

Gal. size - - - -	$4.95
½ Gal. Size - -	$3.95
Control Fluid Refill - - - -	$1.50

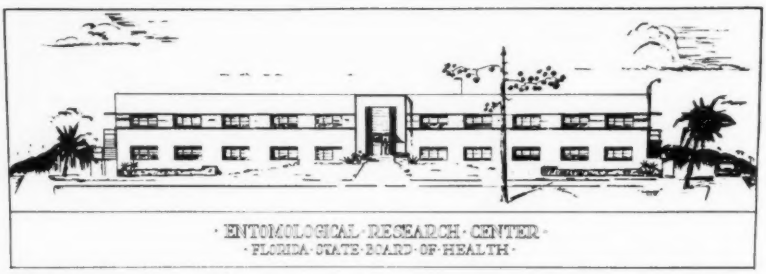
Guaranteed by Good Housekeeping

BIG STINKY Outdoor Fly Traps lure, trap, and kill flies — and once a fly has entered Big Stinky, he cannot escape because of the trap's design.

BIG STINKY has become well known and has been well received in the pest control field. Use Big Stinky yourself and recommend it to your customers this season. It will mean a real help to you in accomplishing good fly control.

For information on network fly control with Big Stinky, Write:

DIOPTRON CO.
BOX 1313 (Unlucky for flies)
MILWAUKEE 1, WISCONSIN



Artist's sketch of new Florida entomological research center which will be completed in early May. The two-story structure will contain offices, laboratories and special insect-breeding rooms.

New Florida Insect Lab.

A new entomological research center under construction four miles south of Vero Beach in Florida's East Coast Indian River County for the Florida State Board of Health's Bureau of Entomology is expected to be completed in early May, Bureau Director John A. Mulrennan has announced.

"Although the new research center is located on the lower East Coast," Mulrennan explained, "It will be an 'All-Florida' project designed to serve all the state's insect control districts and projects.

"Its primary purpose will be the practical application of scientific knowledge to programs designed to kill as many mosquitoes and other insects of public health and economic importance as possible at the lowest reasonable cost.

"Although our knowledge of the habits of mosquitoes and other biting insects is fairly extensive, there are still a number of unanswered questions where good, economical control measures are concerned. It will be the responsibility of the new research center to determine the answers to these questions and to pass on the information to the state's mosquito control districts and various county health department projects in this field.

"We feel the contributions this new research center can make in helping to design inexpensive and effective control measures will speed the day when Florida will at least be relatively free of insects which offer a threat to the state's health and economic development."

The new center, a two-story concrete block structure, will contain offices, laboratories, special insect-breeding rooms, storage space for supplies and equipment and other facilities for entomological studies.

Dr. Maurice Provost will be in charge of the research center,.

Tabanids Repellents Pamphlet

A report on U. S. Department of Agriculture conducted tests of repellents against tabanids is contained in a newly issued USDA bulletin. Field and laboratory experimental results and a list of the chemicals tried are included in this 10-page pamphlet. Reprints are available from the department's Agricultural Research Service, Washington 25, D. C. Just ask for Bulletin ARS-33-2, **Tests of Repellents Against Tabanids.**

Fly-Control at Ill. Fair

(from page 16)

people and, believe it or not, most of them, when asked, would say they had not seen a single fly at the Fair, even though we knew they were there.

It is probably impossible to eliminate flies 100% in this large an area, but keeping them to a minimum so they do not become a public nuisance is possible.

Final report of the State Division of Sanitary Engineers, on file in their office, shows better fly control was achieved by the above program than in the "wonder days" of DDT. Obvious reasons for this being the coordinated work of sanitation and chemicals, extensive larviciding of trucks and breeding areas, the daily fly counts taken by the Sanitary Engineers, and cooperation given by Mr. Strother G. Jones, General Manager of the Illinois State Fair and his staff.

All illustrations and graphs used in this article were furnished by Mr. L. D. Hudson of the State Division of Sanitary Engineers who worked untiringly with us from the beginning.

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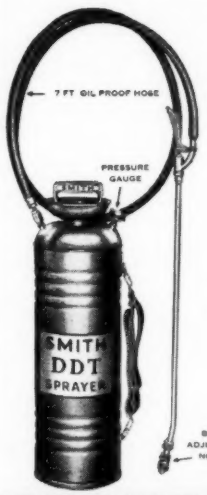

The finest compressed air sprayer made. High pressure gauge, brass connections, brass valve. For all spraying purposes. Adjustable nozzle. 7 ft. oil proof hose. Automatic shut-off trigger control. Sturdy shoulder strap. Unsurpassed.

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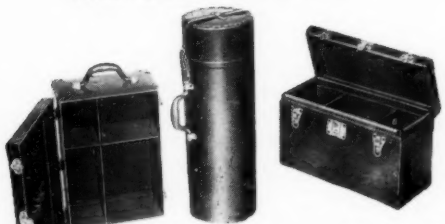

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Sodium Fluoride

Poison Seeds

Super Fluorex V, powerful insecticide powder

Pyrethrum and **DDT** powders and liquids

Paradichlorobenzene

for Effective Rat Control

Phosphorus Paste - Warfarin - Pival
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Fortified Red Squill Extract & Powder
Antu and Antu Tracking Powder
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AFC IB Liquid for the Control of Rat Odors

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Progressive PCOs are adding a Bird Control Service

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Use the

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MSA Safety Suit Booklet

Two styles of MSA Decontamination safety suits are described in bulletin No. 1301-2 just issued by Mine Safety Appliances Co., Pittsburgh, Pa.

One of these, the MSA chemical type decontamination unit, is made from a flexible, butyl-fairprene material. This suit is said to offer protection against nitrobenzene, nitrotoluene compounds, and aniline. It is reportedly designed to allow the wearer maximum flexibility in this work.

Similar in design to the chemical type suit, the MSA acid type decontamination suit is made of neoprene-fairprene fabric. It offers protection against light concentrations of acids, MSA says.

Dipterex and Chlorthion

(from page 30)

practical conditions, more are currently in progress, and others are planned for the current season.

BIBLIOGRAPHY

(1) **Anonymous,** 1954, Chlorthion Studies, California Vector Views 1:2, 2.

(2) **Bruce, Willis N.,** 1953, A New Technique in control of the House Fly, Illinois Natural History Survey, Biological Notes No. 33.

(3) **DuBois, K. P., & Cotter, G. J.,** Studies on the Toxicity and Mechanism of Action of Dipterex, A.M.A. Archives of Industrial Hygiene and Occupational Medicine, in press.

(4) **DuBois, K. P., Doull J., Deroin, J., Cummings, O. K.,** 1953, Studies on the Toxicity and Mechanism of Action of Some New Insecticidal Thionophosphates, A.M.A. Archives of Industrial Hygiene and Occupational Medicine, Vol. 8, 350-358.

(5) **Gahan, J. B., Wilson, H. G., McDufie, W. C.,** 1954, Dry Sugar Baits for the Control of Houseflies, Jour. of Agricultural and Food Chemistry, Vol. 2, No. 8, 425-428.

(6) **Gahan, J. B., Wilson, H. G., McDuffie, W. C.,** 1954, Organic Phosphorous Compounds as Toxicants in House Fly Baits, Jour. of Economic Entomology, 47:2, 335-340.

(7) **Gjullin, C. M.,** 1954, The Toxicity of Aerosols and Residual Sprays to Resistant Mosquitoes in California, Proceedings of New Jersey Mosquito Extermination Association, Mar. 9-12 p. 127-133.

(8) **Guyer, G. E., King, H. L., Smiley, E. S., Ralston, N. P.,** 1954, Chemical Fly Control, Quarterly Bulletin of Michigan Agricultural Experiment Station, Michigan State College, East Lansing, Vol. 37, No. 2, pp. 254-263.

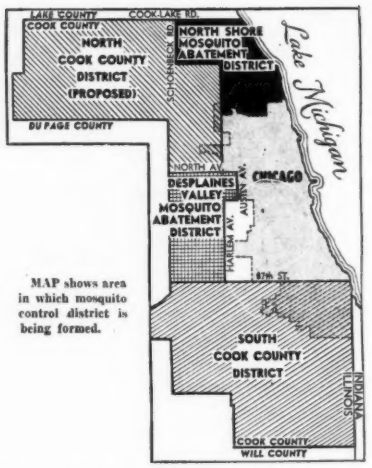
(9) **Keller, J. C., Chapman, H. C.,** 1954, The Toxicity of Phosphoric Acid Esters to Anopheline Larvae, Jour. Economic Entomology 47:4, 628-630.

(10) **Langford, G. S., Johnson, W. T., Harding, W. C.,** 1954, "Bait Studies for Fly Control," Jour. Economic Entomology 47:3, 438-441.

(11) **Peters, R. F.,** 1954, Field Experiments with Organic Phosphates, Proceedings of New Jersey Mosquito Extermination Association, March 9-12, p. 133-136.

(12) **Schrader, G.,** 1952, Die Entwicklung ganischer Fluor- und Phosphor-Verbinneuer Insektizide auf Grundlage ordungen, Monographie, 2. Auflage, Verlag Chemie, 96 pages.

(13) **Schrader, G.,** 1954, Chlorthion, ein neues, wenig giftiges Insektizid aus der Reihe der Thiophosphorsaeureester (in German), Angewandte Chemie 66: 10, 265-267.



MAP shows area in which mosquito control district is being formed.

Some 140,000 residents of northwestern Cook County, Ill., (upper left corner of diagram) are taking steps to form a mosquito abatement district to protect their area from summer invasions by this pest. The area, extending from Elmwood Park and Park Ridge northwest to Barrington, is the last mosquito refuge in Chicago's suburbs. Three other districts already protect the bulk of Cook County, although Chicago proper has no abatement program. Chairman of the proposed district is Charles J. Zanzie, 54 Pioneer, Palatine.

Chemagro Chlorthion Bulletin

A pamphlet on experimental uses of chlorthion (Bayer 22/190) is now being distributed by the Chemagro Corp., New York City.

The bulletin states chlorthion looks promising for control of house flies, specifically strains that have developed resistance to DDT and other hydrocarbon insecticides, in the form of a residual wall spray in barns, pens and other farm buildings. For highly effective, long-lasting control, Chemagro recommends 4 to 8 pounds of active ingredient be applied per 100 gallons of water. All interior surfaces of the building should be treated thoroughly to the run-off point by means of a suitable spray rig.

According to Chemagro, no traces of chlorthion were found in cow's milk from dairies treated with the chemical, nor was the flavor of the milk affected.

Chlorthion is also reported to be highly effective against larvae of the following mosquitoes: **Culex tarsalis** (DDT resistant), **Culex quinquefasciatus, Anopheles quadrimaculatus, Aedes nigromaculis,** and **Anopheles crucians.**

Copies of this bulletin, which also contains information on chemical structure, mammalian toxicity, insecticidal and miticidal effectiveness, household and warehouse pests, etc., can be obtained from Chemagro.

Industrayor insecticide fogging head (upper left insert) is manufactured by The Tanglefoot company, Grand Rapids, Mich. Industrayor is reportedly constructed to mount on a standard one gallon can fitted with a one inch cap. A metal insecticide dip tube extends from the bottom of the fogging head and goes into the insecticide. It can be used with any compressor, Tanglefoot says. The company also manufactures a compressor, and dolly for mounting the equipment as shown in picture.

Stored Product Insect Series

A new series of publications on stored product insects is being set-up by the USDA, announces Randall Latta, head of the Department's Stored-Product Insect Section. All PCOs who want to be placed on the mailing list to receive these bulletins should send their names to Agricultural Marketing Service, Marketing Research Division, Biological Sciences Branch, USDA, Washington 25, D. C.

Noyes to Aid Grain Clean-Up

Clyde C. Noyes, of the University of Nebraska, has taken a temporary appointment with the USDA to assist state extension services in an intensified educational program on grain sanitation.

For many years state extension services in the principal grain areas have been conducting educational programs to help farmers, elevator operators, and grain dealers provide better grain storage, and control insects, rodents, and birds. Mr. Noyes' responsibility will be to educate grain handlers in preventing heavy losses of stored grain and in maintaining the quality of cereal foods.

Suppliers' Staff Changes

G. H. Weldon has been appointed manager of insecticide sales, western division, for Velsicol Corp. He will be located in Berkeley, Calif.

New vice president in charge of sales for James Varley & Sons, Inc., St. Louis, Mo., is **James G. Varley.**

McConnon & Company, Winona, Minn., has elected **J.R. McConnon** chairman of the board of directors, and **James McConnon** president. In other company personnel changes, **R. W. Lundberg** becomes controller; and **W. T. Lemmon** becomes sales manager of the firm's Mackwin Division.

Damp-Woods Invade East

(from page 38)

Both were from the West Coast.

Other places where the dampwood termite has been found in shipments of lumber, include: Oxford, Ohio; Dallas, Texas; Howell, Michigan; Kansas City, Missouri; Wichita, Kansas; Reisterstown (near Baltimore), Maryland; Ottunwa, and Des Moines, Iowa; Oklahoma City, Oklahoma; and Pittsburgh, Pennsylvania.

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Get set for fly control problems. USE . . .

HOPKINS MALATHION

Your head needn't be buzzing with flies like our friend's. Use HOPKINS MALATHION, "One of the safest insecticides to handle." It's safe for you but deadly to flies, EVEN FLIES RESISTANT TO DDT—LINDANE — METHOXYCHLOR. When used as a sugar-bait spray, you get good, residual control for up to 30 days. Malathion is also one of the most effective Clover Mite controls. Available also as a 25% wettable powder.

HOPKINS DIELDRIN

USDA has accepted the use of **DIELDRIN** for control of household pests inside the home. It's the new sure way to control carpet beetles, brown dog ticks, roaches, ants, silverfish, paper nest wasps, and mud daubers.

USE HOPKINS DIELDRIN FOR RESIDUAL HOUSEHOLD PEST CONTROL

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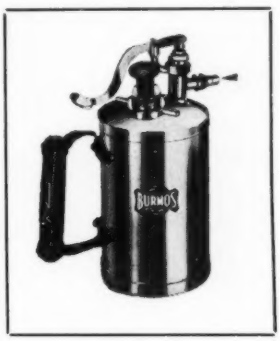

NEW!

Burmos 1 Qt. Sprayer

Here's the finest 1-quart job we've ever seen. Soundly constructed of all brass, this sprayer withstands the corrosive action of water-based insecticides. The nozzle on the Burmos is interchangeable with the nozzle on any PCE sprayer which you may now own. Order one today! They're practical and economical.

ALL BRASS

$9.95 each

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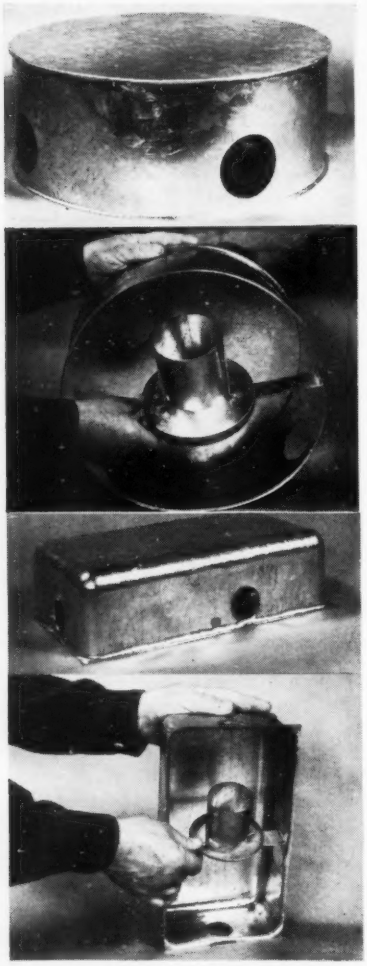

Napesco rodent bait stations come in both round and rectangular shapes. Hoppers are mounted on swivel suspension to enable them to be put in upright position after they are filled.

Napesco Bait Stations

A round, general purpose rodent bait station and two smaller units for mice and small rats are being manufactured by Napesco, Inc., Lafayette, Ind. and Kansas City, Kans.

The large unit has four openings for rodents to enter and is equipped with a swivelling self feeder which holds a pound of bait. Station measures 14" across and 5½" deep. The smaller, rectangular station measures 6 x 11" and 3" deep. The smaller circular station measures 7" across.

A brochure explaining Napesco bait stations is available to PCOs.

Termite Book Out of Print

"Termites and Termite Control," a publication of the University of California Press, is out-of-print and no longer available.

INSECT REPORT

Contains pertinent portions of the **Cooperative Economic Insect Report** issued by the U. S. Department of Agriculture, Agricultural Research Service, during the last 30 days. PCOs noticing infestations in their own areas are urged to report them to **Pest Control** so this information may be added to this monthly report.

A FUNGUS BEETLE
(Alphitophagus bifasciatus)

Maryland: In grain at Beltsville.

A GRAIN WEEVIL

Utah: At Lehi 1100 bushels of wheat infested.

ANGOUMOIS GRAIN MOTH
(Sitotroga cerealella)

Arizona: Moderate infestation in stored sorghum in Pima County.

BOXELDER BUG
(Leptocoris trivittatus)

Utah: Caused some annoyance in homes and offices during warmer winter days. **Virginia:** Entering houses and causing annoyance in Richmond, Blacksburg and Radford. **Maryland:** In homes, Montgomery County.

CASEMAKING CLOTHES MOTH
(Tinea pellionella)

North Carolina: Heavy infestation in a home in Burke County.

CLOVER MITE)
(Bryobia praetiosa)

Arizona: Beginning to appear on Yuma Mesa, mostly on Ranger alfalfa.

FIREBRAT
(Thermobia domestica)

Wyoming: Concern to some householders, especially in basement apartments.

GERMAN COCKROACH
(Blattella germanica)

Wyoming: Two very severe infestations investigated. Controls satisfactory.

GRANARY WEEVIL
(Sitophilus granarius)

California: Heavy infestation in barley in Colusa County.

INDIAN-MEAL MOTH
(Plodia interpunctella)

Utah: Damaging stored grain at Logan.

STONEFLIES

Rhode Island: Adults settling in great numbers on stone walk near house.

STORED-GRAIN INSECTS

Arkansas: Infestations of confused flour beetle, lesser grain borer, flat grain beetles and saw-toothed grain beetle continue active in the delta area. Temperatures toward center of grain pile in many large storage receptacles remain high enough to favor a build-up.

TERMITES

Virginia: Beginning to swarm in some parts of the state. The first winged forms of the year are reported from Richmond. **North Carolina:** Flights of adults observed recently in Rockingham and Wake Counties. **Oklahoma: Zootermopsis augusticollis** has been taken in a lumber yard in Duncan in fir shipped from the West Coast.

TROPICAL RAT MITE
(Bdellonyssus bacoti)

Iowa: Individuals in a neighborhood bothered by bites of this mite. Examination of the premises disclosed that the mites came from an old home in which the occupants had noticed noises in the walls, presumably caused by rats.

John Bean's Rotomist "75" sprayer said to spray to heights of 100 feet.

John Bean Power Sprayer

Food Machinery and Chemical Corp's. John Bean Division, Lansing, Mich., is now producing the Rotomist "75" power sprayer for shade-tree fly and mosquito control.

According to the manufacturer, spray is delivered to the Rotomist's whirl-mist nozzle by a completely enclosed, two-cylinder, plunger-type pump. Pump and fan are powered by a 25 HP engine and the unit has a 75-gallon spray tank.

The unit is said to deliver 19,000 cubic feet of air per minute, have a spray delivery of 400 PSI, and provide thorough coverage and complete penetration of dense foliage to heights up to 100 feet. It reportedly rotates a full 360 degrees with the discharge head pivoting through a 110-degree arc from vertical to 20 degrees below horizontal.

Sprayer is available both in a trailer-mounted model (see illustration) with a weight of 2260 pounds, or in a truck-mounted model which weighs 1800 pounds.

Mal Oil 50 Versatile

William Cooper & Nephews, Inc., Chicago, Ill. maker of insecticides for over 100 years, has recently introduced Mal Oil 50, a 50% malathion oil soluble concentrate. Claimed to be uniquely versatile because it can be diluted with almost any type oil or solvent desired, Mal Oil 50 is said to give excellent control of clover mites and resistant as well as non-resistant roaches. The product is registered for use by PCOs.

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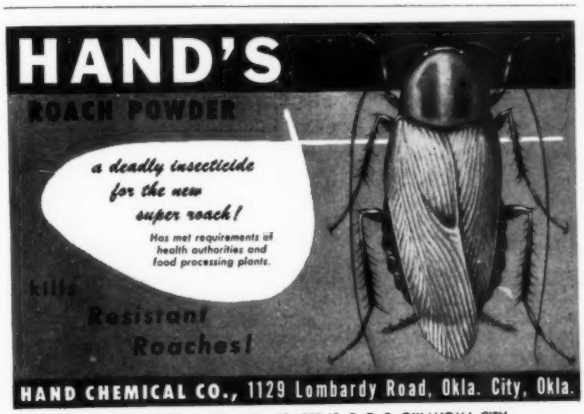
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organization news

Packard Elected Calif. Prexy At Feb. 21-23 Convention

Herbert R. Packard, Jr., Packard Termite & Pest Control Co., Los Angeles, was picked to head the Pest Control Operators of California, Inc., at the group's annual convention at the Ambassador Hotel, Los Angeles, February 21-23. Other new officers are: first vice president, G. Darrell Cardiff, Cardiff Pest Control, Santa Cruz; and second vice president, Kenneth G. Scott, Termite and Pest Control Co., Glendale. Virgil Strong continues as the association's executive secretary.

During the three day meeting delegates heard talks on sales, safety, small business trends, how to hire employees, bookkeeping systems, industry problems, public relations, overhead, insurance, income tax, credit policies, advertising, legislation, and research on beetles and termite problems.

Guests at the annual banquet included Dr. Philip J. Spear, NPCA Technical Director; Professor Walter Ebeling, UCLA entomology department; Professor Roy J. Pence, UCLA entomology department; Charles L. Senn, Engineer-Director, Bureau of Sanitation, Los Angeles Health Department; Dr. Dwight Pierce, Los Angeles consulting entomologist; and Lytle J. Harrison, new Registrar of the California Structural Pest Control Board.

N. M. PCA Meet April 16

Members of the New Mexico Pest Control Assn. will hold a meeting at New Mexico A. & M. College, State College, April 16, announces group president Richard B. Spurrier. The association, in existence since 1953, is currently seeking new members. Interested PCOs should contact the president at P.O. Box 7056, Old Albuquerque Station, Albuquerque, N. M.

Nebraska PCOs Form Assn.

Nebraska PCOs have banded together to form the Nebraska Assn. of Pest and Termite Control Operators, Inc. First meeting for the new group will be held the evening of April 8 at the Agricultural College of the University of Nebraska, Lincoln. A one-day PCO Short Course, sponsored by the University, will precede the meeting.

Association officers are: president, Ward A. Combs, Presto-X-Co., Omaha; vice president, John P. Linn, Industrial Termite Control, Inc., Omaha; and secretary-treasurer, George A. Preece, Mid-State Pest Control, Lincoln. Directors include Roy Mason, Mason Pest Control Service, Omaha; William H. Kohlhasse; and Alan A. Berg, Presto-X-Co., Grand Island.

Nebraska PCOs wishing to join the group are urged to write the secretary at 4033 South 48th St., Lincoln.

Rickel Heads W. Pa. PCA

Gilbert Rickel, Rickel Sanitation, Uniontown, was elected president of the Pest Control Operators of Western Pennsylvania at a recent meeting. Tapped to serve with Rickel during 1955 were: vice president, A. H. Helfgott, Remo Sanitation Co.; secretary, Harry Katz (re-elected), Elco Manufacturing Co.; treasurer, Milton Zlotnick, Reliable Pest Control Co.; and two-year director, John Becker, Tri-State Sanitation Co. All are from Pittsburgh.

At the March meeting Arnold Mallis, of Gulf Research Laboratories, Pittsburgh, addressed delegates on control of spiders, millipedes, centipedes, and related arachnids. Next association meeting will be held on April 14.

Texas PCA Committee Heads

Texas Pest Control Assn. has appointed the following committees and committee chairman for 1955: Advisory, W. I. Elo, Pest Exterminators Co., San Antonio; Legislative, W. A. Ruwaldt, Corpus Christi Exterminating Co., Corpus Christi; Texas A. & M. Study Day, J. L. Howell, Howell Termite Control Co., Houston; Finance, Harlan K. Baker, International Exterminator Corp., Fort Worth; Public Pest Control Projects, W. F. Hall, International Exterminator Corp., Tyler; and Termite Clearance Report Form, G. E. Lister, Lister Pest Control, Houston.

CALENDAR OF MEETINGS

Duval County Pest Control Assn. Monthly Meeting, City Pest Control Co., Jacksonville, Fla., Apr. 5.

Nebraska Assn. of Pest and Termite Operators, Inc., Meeting and PCO Short Course, College of Agriculture, University of Nebraska, Lincoln, Apr. 8.

Professional Exterminators Assn. Monthly Meeting, Museum of National History, New York City, Apr. 11.

Pest Control Assn. of Western Pennsylvania Monthly Meeting, Pittsburgh, Apr. 14.

New Mexico Pest Control Assn. Meeting, New Mexico A. & M. College, State College, Apr. 16.

Washington, D. C. Pest Control Assn. Monthly Meeting, 3054 M St. N. W., Washington, Apr. 18.

Northwest Pest Control Assn. Monthly Meeting, The Standard Club, Minneapolis, Minn., Apr. 21.

Master Pest Control Operators Assn. Monthly Meeting, Dayton, Ohio, Apr. 27.

Illinois Pest Control Assn. Second Annual PCO Clinic, Robert Allerton Park, Monticello, Apr. 28-29.

Arkansas PCO Licensing Examinations, State Plant Board, Little Rock, May 2.

Indiana Pest Control Operators Assn. Meeting, place to be announced, May 10.

Chemical Specialties Manufacturers Assn. 41st Mid-Year Meeting, The Drake Hotel, Chicago, Ill., May 15-18.

Canadian Pest Control Operators Conference, Ontario Agricultural College, Guelph, Canada, May 25-27.

Baking Industry Exposition, Convention Hall, Atlantic City, N. J., Oct. 1-6.

Hold Mich. PC Conference

Annual Michigan State College PCO Short Course was held at Kellogg Centre on the University campus, East Lansing, on March 15-17.

Topics covered at this year's meeting included latest control measures for insects, rodents, and weeds; laboratory sessions; and business meetings dealing with salesmanship, personnel management, and ethical advertising.

Professor Ray Hutson, of Michigan State's entomology department, was in charge of the program.

PERSONAL BRIEFS

Spring seems to bring news of more births than any other time of year. Here are the latest additions: **Mark Spurrier**, 7 lbs. 5 ozs., was born Feb. 16th to **Mrs. and Richard B. Spurrier.** Pop runs Modern Pest Control in Albuquerque, New Mexico; **Bill Spitz** whose Big State Exterminating Co. is in Houston, Texas, tells us his wife gave birth to a red-headed baby boy, **Clayton Paul** on Feb. 4th. The young man weighed in at 6 lbs. 2½ ozs.; **Mrs. F. E. Shoop,** whose hubby runs Texas Termite Control Co. of Wichita Falls, Texas, recently flew to Tachikawa Air Force Base in Japan to visit their daughter who is to have a baby . . . And speaking of hospitals, here's a letter **Henry M. Glasgow's** Roanoke Exterminating Co. of Salem, Va. received from one of its hospital clients recently: "We have found a couple of bed bugs which evidently came to the hospital for maternity care. Please give this your immediate attention." Henry's son, John, took care of this "emergency" and wrote the hospital, "Please tell the housekeeper, Miss Jones, I am very sorry to report that her new patients died in labor." . . . Father Time takes his toll, too. **Nathan Sameth's** death (reported on page 52) leaves only **Mr. Daniel Rose** as one of the early pioneers of our industry still living. **J. Thurston Baker,** 57, passed away at his home in Atlanta recently. He was secretary-treasurer of Capitol City Exterminating Co. **Everett A. Knox,** 55, operator of Ace High Exterminating Co. in Denver, died on March 6th . . . **Harry C. Essick,** long-time U. S. Public Health man who joined Orkin Exterminating some time ago, has been promoted to become branch manager of the company's Columbus, Ohio office . . . **Alyce Tyre,** Wisconsin's only lady PCO, runs Alyce's Pest Control in Milwaukee and promotes her business by wearing pretty blouses covered with different insects. Creates lots of talk and business that way, we're told by competitors . . . **Bill McCain** of Extermital in Dayton, O., reports his company has one scholarship in each of two universities. **Max Stoker** is studying at Purdue, and **Douglas MacPherson** at Ohio State.

CLASSIFIED ADVERTISEMENTS

When answering ads where box number only is given, please address as follows: Box number, c/o Pest Control, 1900 Euclid Avenue, Cleveland 15, Ohio.

Rates: "Position Wanted" 5c per word, minimum, $1.00. All other classifications, 10c per word, minimum $2.00. All classified ads must be received by Publisher at least three weeks preceding publication date and be accompanied by cash or money order covering full payment.

POSITION AVAILABLE

Experienced serviceman with salesmanship and managerial capabilities for general pest control in Pennsylvania, Ohio, Kentucky and W. Va. Must have good background, be honest and responsible. All replies confidential. Write R. D. Erdie, Ace Exterminators, Inc., Watson Hotel Bldg., Fairmont, W. Va.

POSITIONS AVAILABLE

World's largest pest control firm, operating in 27 states, needs several high-caliber men for responsible positions. Unlimited opportunities for ambitious, aggressive young men. Liberal salary and incentive arrangements. Employee benefits include paid vacations, sick leave, life insurance, hospitalization and pension plan. Experience in professions related to pest control helpful though not essential. Training programs for future managers and other supervisory positions open to college graduates, also several openings for service personnel. Replies confidential. Contact Technical Department, Orkin Exterminating Company, Inc., 713 W. Peachtree St., N.E., Atlanta, Georgia.

POSITION AVAILABLE

District Supervisor. Progressive midwest pest control firm looking for man with supervisory, sales and promotion experience. Prefer college graduate. Duties to include supervising branch managers, hiring and training servicemen, building up territories. Substantial salary commensurate with ability. Send full details to Box 368 Pest Control magazine.

POSITION WANTED

Graduate entomologist with BS degree and six years experience in field of pest control would like to buy pest control business or become associated with progressive firm. Box 359 Pest Control magazine.

POSITION WANTED

Graduate entomologist with MS degree from Purdue University, pest control specialization, desires work in North Carolina or vicinity. Available in June. Harry B. Moore, 204 Marstellar Street, West Lafayette, Ind.

POSITION WANTED

Management executive of unusually wide experience; presently owner and directing pest control service and equipment business with interest in another pest control corporation. Will contract in a consulting capacity or on a full time active basis for 1 to 5 years at a very nominal figure (change of location desired for family reasons). Prefer activities relating to sales promotion, advertising and customer relations. Also have successfully directed large scale business research involving merchandise and service sales, both wholesale and retail. Age, close to 50; health excellent; married; university chemical engineering education; bank, credit and personal references available. All correspondence confidential. Box 365 Pest Control magazine.

POSITION WANTED

Entomologist (BS), age 37, married, 11 years experience County Agricultural Agent, seeks employment in pest control or allied industry. Box 367 Pest Control magazine.

WANTED

Prominent New York City concern will purchase established exterminating business, large or small, in Miami, Florida, or New York area. State details. Box 360 Pest Control magazine.

WANTED

Reliable New York City company will purchase exterminating business large or small in New York area. All cash, immediate action. Box 364 Pest Control magazine.

WANTED

Will buy small pest control business in Pennsylvania, Ohio, Kentucky and W. Va. Write details to R. D. Erdie, Ace Exterminators, Inc., Watson Hotel Bldg., Fairmont, W. Va.

WANTED

General pest control business anywhere in New England. Give full details in first letter. Box 361 Pest Control magazine.

WANTED

Pennsylvania PCO will buy small pest control business located in middle Atlantic states. Write details to Box 352 Pest Control magazine.

FOR SALE

Well established pest, termite control business, five trucks, necessary equipment and supplies. Cash sales in 1954 approximately $47,000. Located in fast growing southern city. Write Box 366 Pest Control magazine.

FOR SALE

Dyna-Fog fogging machine. Like new. Slightly used. Excellent buy. A. Green, 141 Sprucewood Drive, Levittown, N. Y.

FOR SALE

Large Niagara duster, with 200 lb. hopper, on skids. Nearly new, used only as demonstrator. Also, repossessed, nearly new Dyna-Fog. Write O. L. Potter, 410 W. Jefferson Ave., Trenton, Michigan.

pestales

Fly 'Swatter'

Harold Schwager doesn't know whether to give up driving or swatting flies.

Not long ago he was cruising along in his jalopy without a care in the world when a little Musca flew right in the window.

Net result: one broken arm, one fractured ankle, one wrecked auto, and one big hospital bill. You see, Harold let go of the steering wheel when he swung at the beast.

* * * *

Bee-Caused

It could only happen in California.

John L. Straightjacket of Glendale had bees in his chimney. Now, he couldn't see wasting good money on a PCO when he could do the job himself. A real do-it-yourself fan, he climbed up on the roof and dropped a gasoline-soaked rag down the chimney.

It worked! No more bees. No more chimney. He had plunked the rag into a bed of hot coals still glowing in the fireplace.

* * * *

Justice

Cockroaches in San Francisco's Hall of Justice are coming under the scrutiny of a grand jury.

The roaches are so numerous they peer at witnesses from microphones, dance on the rail around the jury box and run across the jurors' shoes. Irate counselors are demanding the city do something.

Objection sustained!

ADVERTISERS' INDEX

Acme Protection Equipment Co. 51
American Cyanamid Co. 27
American Fluoride Corp. 55
American Smelting & Refining Co. 53
Aromatic Products, Inc. 12
B. & G. Co. 3, 31
Beechem Laboratories 59
Buffalo Turbine Co. 21
California Spray-Chemical Co. 6
Chapman Chemical Co. 37
Chipman Chemical Co. 36
William Cooper & Nephews, Inc. 30
Cre-O-Tox Chemical Co. 38
Curtis Automotive Devices, Inc. Mar.
Dioptron Co. 54
Dow Chemical Co. 29
Ewing Manufacturing Co. 39
Fairfield Chemical Division 3rd cover
Geigy Agricultural Chemicals Co. 4
Getz Exterminators, Inc. 62
B. F. Goodrich Chemical Co. Mar.
Gow-Mac Instrument Co. 39
Hand Chemical Co. 59
Hercules Powder Co. 19
Hopkins Agricultural Chemical Co. 57
H. D. Hudson Manufacturing Co. 47
Idico Products Co. 44
Larvacide Products, Inc. Mar.
Lethelin Products Co., Inc. 42
Mar-Mel Products, Inc. 46
Martindale Electric Co. Mar.
McLaughlin Gormley King Co. 25
Michigan Chemical Co. 17
Miller Chemical & Fertilizer Co. 48
Mine Safety Appliances Co. 26
Minx Products 56
Moore Brothers Co. Mar.
Motomco, Inc. 15
Napesco, Inc. 50
Orb Industries 43
Orkin Exterminating Co. 59
S. B. Penick & Co. 23
Pennsylvania Refining Co. 50
Per-Mo Products Co. 47
Pest Control Chemical Co. 59
Pest Control Equipment Co. 53, 55, 57, 4th cover
John Powell & Co. 2nd cover
Prentiss Drug & Chemical Co. 8
Residex Corp. 49
Rohm & Haas Co. 11
Scent-Flo Distributing Co. 46
Sennewald Drug Co. 44
Shell Chemical Co. 13
D. B. Smith & Co. 55
Spraying Systems Co. 38
Syntron Co. Mar.
Tanglefoot Co. 56
Thompson-Hayward Chemical Co. Mar.
Universal Electric Products Corp. 42
Universal Paper Products Co. Mar.
Vaccinol Chemical Co. 39
James Varley & Sons, Inc. 51
Velsicol Corp. 7
Virginia Smelting Co. 45
B. & D. A. Weisburger 53
Whitmire Research Laboratories 41
Wisconsin Alumni Research Foundation Mar.
Wood Treating Chemicals Co. 35
Wyandotte Chemicals Corp. Mar.

Bromotox New Space Fumigant

A new space fumigant, Bromotox, is being manufactured by Eston Chemicals Division of American Potash and Chemical Corp., Los Angeles. The product is said to be a mixture of methyl bromide and ethylene dibromide that is under pressure in the container and is applied in the same manner as commonly practiced with methyl bromide alone.

A pamphlet describing advantages and uses of the product is available from the company or from Bromotox mid-west distributor, Ferguson Fumigants, Inc., Ferguson, Mo.

Answer to Notebook on page 50

One of the Dermestidae (carpet beetle, buffalo beetle, etc.). I haven't pinned it down to the exact species myself yet. Anyhow, I debugged the mount and hung it on my daughter's bedroom wall. She tells her friends it has rare insects living inside. Maybe she's right!

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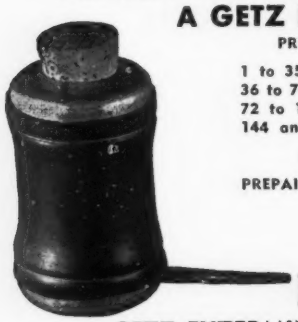
A GETZ Blower



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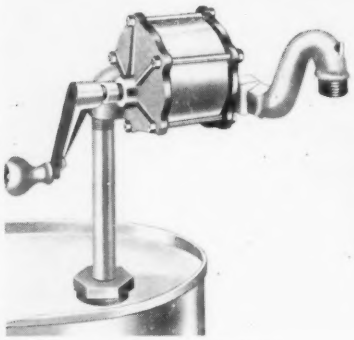

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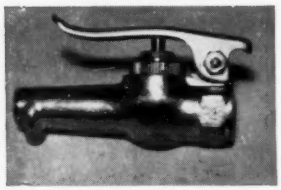

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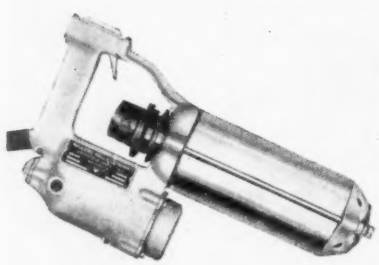

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